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THE PHILOSOPHICAL REVIEW

EDITED BY

FRANK THILLY, G. WATTS CUNNINGHAM
and GEORGE H. SABINE

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November, 1932

I. Louis de la Forge and the Critique of Substantial Forms. . . . A. G. A. BALZ

II. Space, Time, and God. A Chapter in Eighteenth-Century English Philosophy. JOHN TULL BAKER

III. The Experimental Philosophy of Robert Boyle (1626–91). PHILIP PAUL WIENER

IV. DISCUSSION
Reason and Nature. . . . . E. A. BURTT

V. REVIEWS OF BOOKS

Charles Hartshorne's and *Paul Weiss'* Collected Papers of Charles Sanders Peirce: by Harvey G. Townsend—*William Pepperell Montague's* Belief Unbound: by John Baillie—*Perceval Frutiger's* Les mythes de Platon: by Glenn R. Morrow—James Bonar's Moral Sense: by T. V. Smith—*Sushil Chandra Mitter's* La pensée de Rabindranath Tagore: by Kenneth Saunders—*F. F. Hallett's* Aeternitas: A Spinozistic Study: by Clifford Barrett—*Jacques Maritain's* Art and Scholasticism: by Gerald B. Phelan—*Broder Christiansen's* Die Kunst: by Van Meter Ames.

VI. DESCRIPTIVE NOTICES

VII. NOTES

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THE PHILOSOPHICAL REVIEW

Contents for November, 1932

Louis de la Forge and the Critique of Substantial Forms
A. G. A. BALZ 551

Space, Time, and God. A Chapter in Eighteenth-Century English Philosophy ..... JOHN TULL BAKER 577

The Experimental Philosophy of Robert Boyle (1626–91)
PHILIP PAUL WIENER 594

Discussion
Reason and Nature ..... E. A. BURTT 610

Reviews of Books 621
Charles Hartshorne's and *Paul Weiss'* Collected Papers of Charles Sanders Peirce: by Harvey G. Townsend—*William Pepperell Montague's* Belief Unbound: by John Baillie—*Perceval Frutiger's* Les mythes de Platon: by Glenn R. Morrow—*James Bonar's* Moral Sense: by T. V. Smith—*Sushil Chandra Mitter's* La pensée de Rabindranath Tagore: by Kenneth Saunders—*H. F. Hallett's* Aeternitas: A Spinozistic Study: by Clifford Barrett—*Jacques Maritain's* Art and Scholasticism: by Gerald B. Phelan—*Broder Christiansen's* Die Kunst: by Van Meter Ames.

Descriptive Notices 643

Notes 652
Hartmann Prizes. Current philosophical periodicals.

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THE

PHILOSOPHICAL REVIEW

LOUIS DE LA FORGE AND THE CRITIQUE OF SUBSTANTIAL FORMS

I

THE purpose of this essay is not to study the philosophy of Descartes, but rather to discover, if possible, what a Cartesian disciple conceived that philosophy to be. We are concerned, therefore, with a contemporary's interpretation of the philosopher. Louis de la Forge writes with the intention of setting forth the meaning of the new doctrine. He certainly believes himself to be wholly faithful to Cartesian principles. He has but a slight interest in independent philosophical construction. He is aware of ambiguities in the master's teachings, and it is part of his purpose to clarify them; but he never doubts that what Cartesian principles meant to him they meant to Descartes himself. In employing La Forge as the chief thematic material we shall find occasion for corroboration and illustration by reference to Dom Robert Desgabets.

Descartes recoiled from some of the consequences of his metaphysical foundations for science. Gilson indicates that he was loath to accept the dualistic view of body and soul. This view imperilled, as he well knew, the unity of the human being, and his protests that the two substances can be united in the one being express his sensitivity concerning the issue. The pineal-gland theory cannot be dismissed as a mere gesture. The earnestness of his desire to reconcile his doctrine of substance with the requirements of the Eucharist is matched by the seriousness with which he entertains the theory of the functions of the pineal gland. More-

over, there persisted a conflict between his biological account of the nature of sensation—sensation as bodily phenomenon providing guidance to the organism—and the status of sensation in terms of the dualism of soul and body.

The followers of Descartes had to begin, in a sense, where Descartes had arrived. While Louis de la Forge and many others were faithful enough to the philosopher's teachings, they were forced to a shift of emphasis. Taking fuller cognizance of the consequences of the body-soul dualism, their approach to metaphysics and epistemology is altered. It was scarcely possible to recapitulate the original process and so to pass from the doubt to the dualism, even in the degree in which we may say that Descartes had done so. Knowledge of the terminus affected the interpretation of the procedure leading to it. If the dualism was for Descartes a conclusion he had reached but nevertheless found difficult to accept, it was for the follower a principle in the light of which every Cartesian statement must be interpreted. The method of doubt and the *cogito* are thought in terms of the dualism; and the latter is even viewed as responsible for the former. The dualism, for a follower like La Forge, is not only a metaphysical conclusion; it is rather a statement of 'psychological' and physical fact determining the first steps in epistemology and metaphysics. All inquiry is concerned with subject-matters defined by the dualism of substances; the latter, then, defines and controls the issues involved in the inquiry.

To the Cartesians, however, the new philosophy was not just another philosophy, but in many ways final, and also, for the first time in history, Science in the eulogistic sense. What mystifies a man like La Forge is the strength of opposition the new doctrine encountered. His practical problem is to state the Cartesian philosophy in such a way as to facilitate conviction. He was faced by the fact that the doctrine had the reputation of being revolutionary. He recognized ambiguities of statement, if not of meaning, in the Cartesian writings. To eliminate the ambiguities and to overcome the prejudices against novelty was the expositor's task. In addition to this, of course, it was necessary to overcome by extension certain of the residual difficulties in the doctrine itself.

La Forge believes that the novelty of Cartesian philosophy and

the secret of the prejudiced opposition it encounters lie in the dualism of substances. He is keenly conscious of the great intellectual economy provided by the new definitions of matter and of spirit. But novelty and economy receive pointedness only by contrast with a background, and this background is Scholasticism. The dualism has taught La Forge that the principles of the School are useless and obscure. When we have learned that there are only two kinds of being, bodies and spirits, all existence is simplified. Such a view contrasts radically with the complexities and unintelligibilities of " formes substantielles des Corps, qualitez réelles, impresses, intentionelles ", and similar conceptions. But La Forge is aware that novelty of contrast with established doctrine can be most effectively ameliorated by a demonstration of the doctrine's essential respectability. This is to be accomplished by demonstrating that Cartesianism represents tradition. In brief, Descartes must be revealed as an Augustinian even if he cannot be pictured as an Aristotelian and a Thomist. Accordingly, La Forge devotes the Preface of his book [1] to a proof that the Cartesian view of the soul is identical with that of St. Augustine. Moreover, he seeks to prove that St. Augustine's views are opposed to those proclaimed by the School. To this end he insists that the saint did not confuse spirit and corporeal or animal spirits, or confuse processes in the brain with events in the mind. Augustine, like Descartes, assures us that we may conceive of a substance which is not the object of sense and imagination.

With these strategical advantages gained, La Forge may proceed to the details of exposition. That which is to be expounded,

[1] *Traité de l'Esprit de l'Homme, de ses facultez et fonctions, et de son union avec le corps.* Suivant les Principes de René Descartes. Paris, Girard, MDCLXVI. All references are to this work. Accents are very sparingly used in this edition, and no attempt has been made to put in the omitted accents in the quotations or to modernize the spelling.

The references to Desgabets (born in the first years of the seventeenth century, died Mar. 13, 1678) are to the documents forming the Appendix (pp. 299–422) in Paul Lemaire, *Dom Robert Desgabets, Son Système, son influence et son école, d'après plusieurs Manuscrits et des Documents rares ou inédits.* Thèse pour le Doctorat présentée à la faculté des lettres de Grenoble. Paris, Alcan, 1901. Of Desgabets' many writings, a very little was printed during his life or shortly afterwards. Many unpublished MSS. remain. A valuable collection of these is published for the first time in the appendix to Lemaire's volume.

clarified, and given systematic statement, is the dualism of body and soul with its immediate consequences. Ambiguities of statement in Descartes' writings must be removed, together with waverings and uncertainties in his teaching. The meaning of the dualism for the study of Man and Nature is to be set forth. The problem fixed by the dualism itself, the relation of mind and body, may then be solved. When all this has been accomplished, the metaphysical foundations for the new knowledge of nature will have been established, and the fears of the theologian may be abated. La Forge may have limited his task to Man because of a lack of competence in physical science. As a physician his chief interest is in man. But it is more reasonable to believe that the limitation is a direct expression of his comprehension of the cardinal principle of Cartesianism, and therefore of the practical needs of defense, of propaganda and popularization.

II

The first step in the removal of the ambiguities of the Cartesian doctrine, and in assuring its comprehension, is to inquire why there should be any ambiguities or difficulties of comprehension at all. Descartes' language is misleading at times, and his readers have been misled.[2] But the difficulty is vastly deeper than a question of mere terminological consistency. The real problem is why the fundamental Cartesian ideas are not apparent to everyone. The idea of the soul as a substance the essence of which is thought, of matter as in essence extension—these ideas are clear and distinct. They are, moreover, innate.[3] Nevertheless, men must be persuaded of these ideas. All men are rational, for good sense is the most universally distributed of things, and human rationality

[2] La Forge admits that he may scandalize some very scrupulous Cartesians by his use of the term idea. Descartes used it not only for the forms, *i.e.*, the thoughts, of the spiritual substance, but also for the forms of the animal spirits. La Forge proposes to restrict the term to the former usage, and is at great pains to indicate that he is really faithful to Descartes' meaning when imposing this restriction (Preface; also Ch. X, pp. 98–9).

[3] Innate ideas are three in number—of the substance that thinks, of extended substance, and of the union of the two. The real meaning of innate idea is the possession of a faculty for producing them; they are innate in possibility, not in act, like figures in wax, but not as so many states of soul disposed like pictures in a gallery (Ch. X, p. 142; Ch. XX).

is the very fountainhead of these clear ideas. Notwithstanding all this, the Cartesian dualism appears to the generality as a novel and revolutionary conception.

La Forge understands that there is something paradoxical here. Ideas that are universal, innate, and so clear and distinct that they are indubitable, appear for the first time (with some reservations concerning Augustine) in the teaching of Descartes. Why is it so difficult to bring them from potency into act? It is necessary even to prove the proposition that everything that thinks is immaterial. For there are some who go so far as to admit that the universe is composed of spiritual and corporeal substances, but nevertheless do not consider that thought belongs peculiarly to the first, since they believe it may be communicated to the second. In addition, there are opponents who think that body alone exists, and urge that the sole difference between one body and another depends upon the relative grossness or subtlety of matter. The primary Cartesian ideas are necessarily accepted by the mind that understands them. Since they are generated by the intrinsic nature of good sense or reason itself, there can be no obscurity in them. Yet the fact is that the Cartesian ideas seem obscure. How does it come about that they are so? And how was Descartes enabled to rid them of the obscurity which somehow attached to these ideas? [4]

The answer to this seeming paradox, La Forge believes, lies precisely in this fact, that neither idea is clear and distinct without the other. Unless we conceive matter as a substance the essence of which is extension, we cannot properly conceive spirit as a substance the essence of which is thought. Conversely, the idea of spirit brings into clarity what matter really is. Augustine, in effect (although La Forge does not say this) is ambiguous in expression concerning spirit because he had an inadequate conception of matter. Descartes succeeds because his ideas of spirit and matter are equally clear and distinct. La Forge and Desgabets are in complete agreement about this. In philosophical thought as well as in popular opinion, confused ideas of spirit and body have prevailed. The source of confusion lies in this, that immateriality has been taken to mean *subtle matter*. Men

[4] Ch. IV, p. 24; *cf.* Ch. XIII, pp. 186–7.

possess the bad habit of conceiving all things after the manner of bodies, a habit rooted in the prejudices arising in infancy. Even the term 'spirit' confuses men because of its original signification—La Forge says that in every language its primitive meaning was 'breath'. This confusion of spirit and subtle matter has been conserved in and fostered by the scholastic distinction between matter and form.[5] Some men have thought of the soul as a body or as a harmony of the body. Others, instructed by faith, have declared it to be immaterial. But since these latter did not know what immateriality really means, they thought of the immaterial soul after the analogy of the forms of nature. Thus they were led, on the one hand, to endow the soul with all the functions found within the human organism—and so the Cartesian definition of the essence of the soul as thought is incomprehensible to them. On the other hand, they were led to construe the soul in corporeal terms as subtle matter. The total result was an idea partly spiritual, partly material, and altogether monstrous.

Philosophical language has preserved in more or less disguised fashion these very confusions. Forms, it is true, have been declared immaterial. But what has immateriality really meant in this context, that is, for La Forge, the context of scholastic teaching? Immateriality of form has not been defined in terms of matter defined as that the essence of which is extension; it has been contrasted with the unity of matter and form. If form has been regarded as immaterial, nevertheless its immateriality does not conflict with the unification of form and matter in a thing. Forms are immaterial in the sense that form in its purity may be somehow attained by dematerializing the thing as a unity of matter and form. Immateriality is thought of, in effect, as a matter of degree, and if forms are said to be immaterial, they are not immaterial *substances*. These very uncertainties in the notion of the immateriality of form, La Forge thinks, have made possible the identification of form with subtle matter, if indeed

[5] Ch. IV, p. 25. Desgabets, in the essay "De l'union de l'âme et du corps" (Lemaire, pp. 326–47) ridicules the idea of identifying the soul with subtle matter. His appreciation of Descartes' contribution to clarity in the ideas of spirit and matter is emphatically expressed. He too asserts that the whole subject of the union of soul and body has been in a state of confusion because men did not know what an immaterial substance really is.

this identification has not defined the meaning of form. Even at best the School, when given credit for the proposition that forms are immaterial, does not represent or anticipate the Cartesian truths. For example, the School asserts that the soul is a spirit because it is not extended. But this, says La Forge, is not the Cartesian doctrine. Descartes insists that the soul is not extended because it thinks. It is not an immaterial form but thinking substance in the sense of a substance the very essence of which is thought. The Cartesian meaning therefore signifies that thinking cannot be a function of matter or a property of a thing defined as the unity of matter and form. Matter, whether gross or subtle, is incapable of thought.[6]

These confusions with which Scholasticism is beset, as La Forge thinks, have been carried over into epistemology. The School thought that the gap between thought and things—a gap that the Cartesian truths make undeniable—could be bridged. The notion of the intentional species was taken as the solution of the problem concerning the relation of thought and things. But when we start, as we must, with the dualism of substances as defining thought and things, a new account of perception and of knowledge is demanded.

At this point it is imperative to recognize that Scholasticism and Cartesian doctrine are two radically different contexts within which terms must be defined. It is impossible to carry over into the Cartesian context the meanings given to matter, form, and intentional species by Scholasticism. Of this La Forge is, on the whole, quite well aware. From the Cartesian standpoint, the intentional species, if produced by body, must be extended; the species is corporeal, material, in the sense in which matter is the very antithesis of spirit or thought. But for the School the fact that the species is produced by a thing, or comes from a unity of matter and form, does not necessarily imply that it is corporeal or extended or material in the Cartesian sense of the term. It is produced by the form, and form is in principle unextended. It is a likeness of the thing and is generated by the form of the thing.

[6] Ch. XIII, pp. 187–8. La Forge rejects the doctrine of the School to the effect that the soul is virtually, although not really, extended. Virtual extension, if it mean anything, means parts outside of one another, and hence implies extension.

It represents the nature of a given particular thing because it is produced by the form of that thing. At the same time, however, it contains the universal nature of the species to which the particular body belongs. A form is identical in nature throughout the whole of the species to which particular examples belong, although it is numerically different in the various individuals. The scholastic species is an image of the thing, but the thing is both matter and form. It is then impossible to preserve the meanings of the term in the Cartesian context. The species in this context is like the thing in the sense in which every thing is extension and motion. It is figured motion leading from the thing to the organs of sense. The Scholastic species is simply supplanted by the Cartesian mechanism of perception.

The question of knowledge has been obscured, La Forge tells us, for two reasons. Most thinkers have regarded bodies as well as spirits as capable of thought. Again, men confound the ideas or notions that the spirit immediately apprehends with the corporeal species serving sense and imagination.[7] On the principles of Cartesianism, La Forge insists, the meaning of corporeal species must be strictly confined to the field of extension and motion. If knowledge be regarded as the reception of corporeal species in the *puissance cognoscitive* even mirrors must be said to know. The reception of species, however, if it means anything in the Cartesian context, means local motion and nothing more. Imagination and memory are just other cases of local motion.[8] Scholasticism has led men to study the nature of knowledge by looking at corporeal things instead of regarding the nature of spirit as such.[9] If corporeal species are only accidents or modes of body, their whole nature is to be extension and motion, and accordingly they can be received by an extended subject alone. They cannot be received into spirit at all.[10]

Thus a double adjustment must be effected. The species, since

[7] Ch. X, p. 98.

[8] Ch. IX, pp. 92–3.

[9] Ch. IX, p. 95.

[10] Ch. X, p. 110. Desgabets regards the corporeal species as traces formed in the substance of the brain by the course of the animal spirits and contrasts these with the "idées spirituelles de l'âme"; there is, he says, a *liaison fort étroite* between the two (Lemaire, p. 335).

it must be extended and material in the Cartesian sense, must be conceived in just those terms into which every material phenomenon is resoluble. It is defined as "l'impression que fait l'objet interieur ou exterieur sur nos sens interieurs ou exterieurs." The corporeal species, says La Forge, must be considered in four stages: in the object, in the external sense, in the pineal gland, and in that part of the brain which serves as the organ of memory. Extra-organically and intra-organically, the species is reducible to extension and motion. In the brain it is a motion or, with respect to memory, a trace. "Si vous considerez dans leur origine, ou dans leur cause, ces especes ne sont rien que les diversitez qui se trouvent dans les Corps . . . soit dans la figure & l'arrangement de leurs parties, soit dans leur mouvement ou leur repos, à raison desquelles ils peuvent faire quelque impression sur les fibres des nerfs qui se rencontrent dans l'organe de quelqu'un de nos senses exterieurs; si vous les considerez maintenant dans cét organe, ces especes sont toutes les manieres differentes dont ces Corps agitent ces nerfs, & ouvrent par leur moyen certains pores des ventricules . . . sur la glande ces especes ne sont autre chose que la diversité que l'ouverture de ces pores aporte dans le cours des Esprits, & dans la situation de la glande; enfin dans la siege de la memoire, ces especes sont la disposition que laisse le cours des Esprits en passant par ces pores qui ont esté ouverts par l'action des objets de dehors. . . ."[11] In short, the perceptual process from the source to the brain is the transmission of motion, and whatever meaning the corporeal species may have in terms of the process depends upon this.

The second adjustment necessary for the theory of corporeal species in dualistic terms follows from the distinction between the immediate object of spirit and the physiological correlate. The terminus of the chain of motions is a motion. The reception of the 'species' is not even the production of an idea. Since all knowledge is within spirit and the acts of knowing do not extend beyond the soul, it is impossible that the corporeal species could be the forms by the immediate perception of which we are said to have thoughts. The impressions within the soul, and the corporeal species (as the train of motion at any point in the process

[11] Ch. X, p. 113.

of perception), bear no resemblance to one another.[12] The corporeal species is not then the immediate object of the mind. Since thought is the essence of spiritual substance, and since mind in knowing never goes beyond itself, the act of perception or knowing—for all knowing is perceiving—and the immediate object are both within the soul-substance. All operations of the spirit are reducible to two: "apercevoir ou connoistre" and will. Sense, imagination, reminiscence, and understanding (*entendement*), are modes of the first, while judgment, inclination and appetition pertain to the second. There is indeed a sense in which understanding is unique; it is not dependent upon the body for its specific acts. But the specific contents of sense-perception, reminiscence and imagination, although like the ideas of pure understanding they are spiritual entities, are occasioned by equally specific bodily processes.[13] The immediate object of the mind is then a state of itself; it is a thought or idea, a spiritual content. 'Pensée' is defined as "cette perception, conscience, ou connoissance intérieure que chacun de nous ressent immediatement par soy mesme quand il s'apercoit de ce qu'il fait ou de ce qui se passe en luy".[14] "Connoistre" is "simplement apercevoir ce qui est interieurement representé à nostre Esprit".[15] "Les Idees ou Notions Spirituelles, cette forme de chacun de nos Pensees par la perception immediate de laquelle nous avons connoissance de ces mesmes Pensees,"[16] are the objects of perception.

The corporeal species is not an image or picture. The pictorial image is a state of the soul itself.[17] Sensation is not less a perception or thought because it has body as its object. The physiological sense-process, of course, is neither a feeling nor a

[12] Ch. X, pp. 103–4, 110–3.

[13] Ch. VIII, pp. 75–6. Reminiscence must be distinguished from memory; the latter is a corporeal faculty which retains by means of vestiges the species of the corporeal objects, while reminiscence is the activity proper to spirit in the process of recall (pp. 84–5).

[14] Ch. II, p. 14.

[15] Ch. IX, p. 96.

[16] Ch. IX, p. 99.

[17] La Forge states that, before speaking of the spiritual ideas to which the corporeal species are attached, it is necessary to meet the charge that he is not faithful to Descartes (ch. X, pp. 114–5, 143). He has evidently met the belief that Descartes in the "De l'Homme" wrote as if the corporeal species were exactly like a painting of the object.

thought. All of this leads necessarily to the central fact, a fact upon which depends the solution of the problem of mind and body and also of the problems of epistemology. This fact is that there is a systematic correlation between the spiritual entity which is the immediate object of the spiritual activity of perceiving, and the 'corporeal species' defined as motion in the brain.

The fallacy of construing spirit as immateriality and immateriality as subtlety of matter resulted in the belief that the species was qualitatively similar to the object itself. From this further consequences flowed. In the first place, the object in the external world was taken to be the qualitied thing of perception. That is, in effect, the things that uninstructed common sense regards as existing independently were taken as being in themselves what they seem to be for perception. But La Forge insists that the thing is really extension and motion and nothing else. Again, the School taught men to think that similarity in real being was necessary for 'intentional' or 'representational' similarity. The species could represent the thing for knowledge because it really resembled the thing. Thus knowledge was regarded as dependent upon a real similarity between the beginning of the perceptual process in the thing and its 'mental' terminus. Moreover, thinks La Forge, the principle that there is nothing in the understanding that was not first in sense reinforced this view of perception. In turn, the intentional-species theory of perception reinforced the principle.

La Forge insists that Cartesian principles oblige us to reject all of this. Sensitive knowledge indeed cannot be wholly different from knowledge of and by the understanding. The reason for the resemblance between knowledge of sense and knowledge of understanding, however, is not found in the notion of the corporeal species or in some process of dematerializing the species, but in the fact that sensation and understanding are faculties of one and the same spiritual substance, and the ideas of one and the other are entities within the soul and partake of its nature.[18] There is

[18] Ch. IV, p. 29. Ideas as modes of thought are identical. They differ in four ways: (1) according to whether they represent clearly and distinctly, or confusedly; (2) according to the things represented; (3) according to the powers they serve, whether sense, imagination, reminiscence, or pure under-

a difference between the two kinds of knowledge. The distinction is that between the confused character of the sense-idea and the clearness and distinctiveness pertaining to the idea of the understanding. The confused nature of sensation is indeed a proof that there is nothing in things similar to the qualitative properties of the sense-idea. Cartesian principles, for La Forge, assure us of the through-and-through perspicuity of the material world. Mathematics applied to extension and motion is exact science. The fact that an idea is clear and distinct is the very sign that there are in things properties similar to those implied in the idea.[19] La Forge states definitely that the Cartesian doctrine cuts directly across the principle that there is nothing in understanding that was not first in sense. Two meanings could be given the principle, and neither is true. It is not true that images of understanding resemble the things in nature according to real resemblance. Nor is it true that all knowledge is derived from the sense-impressions arising within the spiritual soul.[20]

The representative function of ideas can be comprehended, says La Forge, only when spirit is placed "en parallele" with the body.[21] Spirit and body are alike in that both are substances, possessing essential attributes. For this reason each has specific traits—figure, mobility and divisibility for the one, volition, understanding and reasoning for the other. Just as the body at every moment possesses a specific figure, is in a specific condition, so the soul at every moment has a specific idea. Extension as such is indivisible, and so body is in general inseparable from its parts; in the same manner the soul is inseparable from its functions. The diverse figures of body are only so many unlike ways in which the superficies is diversified and limited. Ideas are the different forms in which the acts of the soul are "revestus", limited, and determined.[22] But these likenesses of body and soul are due to

standing; and (4) finally, according to the causes which contribute to their production (ch. X, pp. 138–42). Desgabets states that all the ideas that come to us by way of the body are equally spiritual, and do not bear the slightest mark of matter (Lemaire, p. 339).

[19] Ch. X, p. 108.

[20] Ch. X, p. 122.

[21] Ch. X, p. 127–8.

[22] Ch. X, p. 128–9.

the fact that each is a substance. They do not indicate a resemblance of substantial nature. A state of the one remains a mode of existence wholly unlike a mode of the other. From this it follows that knowledge does not depend upon similarity in 'real being'. But now characteristically new difficulties arise. It is difficult, La Forge uneasily confesses, to understand perceptual knowledge. He is evidently somewhat nonplussed because the new truth—or rather this recent attainment of truth—makes knowledge as the relation of idea and thing more difficult instead of less difficult to understand. However, ideas do in fact represent things. There must obtain a dependable relation between idea in the soul and the thing. We must re-define 'resemblance' for epistemological purposes. Thus a thing may be said to resemble another according to its intentional or representative being when it has the power to make us think of that other, even if the former has no real, positive, or sensible relation to the latter. Desgabets sums up the possibilities for scientific knowledge of things by pointing to three alternatives. First, we may assert that there exists in the perceiving subject a quality similar to the quality characteristic of the perceived thing itself; but this is fallacious, for it confuses perception itself with things. The second possibility is this: we may say that knowledge is a relation between the perceptual quality on the one hand and local dispositions plus a sensible quality (unlike the perceptual quality) in the thing perceived; but this view is really meaningless. We seek to retain the thing as qualitative without being able to give any intelligible meaning to the notion of a quality that is not a quality of the perception in the soul. Thus there remains only the third, the Cartesian, view: perceptions in the soul, on the one hand, and "local dispositions" and nothing else in the thing, on the other hand, without resemblance between the two orders of fact. Thus for La Forge and Desgabets ideas undeniably represent things which they in no sense resemble, and upon this knowledge depends. Since ideas do represent things it must be possible for them to accomplish the feat. La Forge, however, remains uneasy concerning the issue. He must have suspected that "intentional resemblance" was not an explanation so much as the thing to be explained. Since 'esprit' is a thing that thinks, it must of

necessity be a thing that can represent by means of a thought that which is not a thought at all. The power to do this must be regarded as a consequence of the essence of the soul.[23] In this sense there can be no question why and how the soul not merely knows but knows physical things.

In certain respects, however, this answer is too easy. The rational principle, as the power of knowing and of distinguishing the true from the false, cannot doubt that its clear and distinct ideas constitute knowledge. In short, matter, as the field of extension everywhere penetrable by mathematics, and the clear and distinct ideas of understanding, are related by the very nature of thought itself as a principle. There is really no question—God having been demonstrated not to be a deceiver—whether and how spirit can know matter. Clearness and distinctness of idea is knowledge. But difficulty arises because the ideas of sense, which are not clear and distinct, but confused, claim to know things by representation. Such ideas are not pure products of the understanding, but are somehow conditioned by bodily operations. Even in terms of the new theory of the perceptual process, ideas are remote from things. As Desgabets states, all of them are equally spiritual even if some do come by way of the body. Moreover, the new doctrine of the mechanism of perception is of no help. All that it provides is a more accurate and specific statement of the difficulty. The theory of the mechanism of perception explains the causal relationship between the terminal point in a chain of motions, that is, the movement of the pineal gland or its trace, and the extra-organic thing. It shows us that the relation of idea and thing is really the relation of idea in the soul and movement or trace in and of the gland or brain. But idea and brain-process are each within opponent substances. If the sense-impression be conditioned by anything physical, it is conditioned by the brain-movement. But what this conditioning means remains as obscure as before.

Since knowledge of things by way of innate ideas and the pure ideas of understanding presents no difficulty; and since La Forge equally believes that there is no difficulty in the case of ideas which we have because we determine ourselves to think; there then

[23] La Forge, Ch. X, pp. 102–3, 130–1. Desgabets, Lemaire, pp. 376–7.

remain only the ideas of sense whose rôle in knowledge is obscure.[24] The problem is twofold. What relation is there between the sense-ideas of particular things and the universal ideas of the pure understanding? And again, how can a sense-idea in its specific qualitative being represent, not a thing in general, but a specific and particular material thing? In the first case the inner dematerialization of the species must be replaced in the new context by a new mode of conceiving the relation between sense-impression and pure idea. The problem is whether, and how, the clear ideas of understanding can be applied to, or can employ, the confused ideas of sense in a systematic organization of knowledge. The answer will define the rôle of observation and experiment in science. The second problem depends upon a demonstration that there is some systematic and exact relation between the sense-percept with its specific qualities and a given particular nucleation in extension which is the 'thing' said to be represented by the former. Matter as Desgabets says is differentiated by "local dispositions"; what assurance have we that there is a constant relation between the local dispositions defining a thing in the field of extension and the percept we are said to have 'of' that thing? This is the point that La Forge recognizes to be critical for epistemology on a Cartesian basis; and he recognizes, moreover, that the solution depends upon the solution of the mind-body problem. Or, to state the matter more accurately, the relation of soul and body must be so construed as to justify the substitution of 'intentional' resemblance for real resemblance between idea and thing.

III

The union of soul and body, La Forge declares, is the most remarkable thing in all creation. We must not becloud the question with vague notions of corporeal species. Nor can we depart from the strict terms of the dualism of substances. Some of the followers of Descartes appear to believe that the soul and body

[24] Ch. X, pp. 131–4. The soul is partially independent of the body for its ideas. The "entendement pur" is able to perceive all sorts of objects of thought without the aid of the corporeal species. Thus some of the soul's ideas are independent of its correlation with the body. Moreover, the will may contribute ideas that, with respect to some aspects at least, are independent of bodily occasions (ch. VIII, pp. 84–5).

are united by a special mode of being. If they mean, as they appear to mean, that this something is neither spirit nor body, they are wholly unfaithful to Cartesian doctrine. They are like those who conceive matter and form to be united by a middle term differing from the one and the other. If we wish to avoid such ambiguities, let us simply ask, are such alleged uniting principles or qualities extended or non-extended?[25]

There are two approaches to knowledge of the properties of the spirit. We may inquire, why has the soul at a given moment such and such thoughts rather than other possible thoughts? We are directed towards the properties possessed by the soul in virtue of its union with the body. This approach, however, never furnishes the clue to the essence, the real attributes, of the soul. This essence is apprehended by a "sentiment interieure" alone; thought always implies this immediate awareness. La Forge here virtually equates thought, consciousness, and spirituality. The nature of thought consists "dans cette conscience, ce tesmoignage, & ce sentiment interieur par lequel l'Esprit est adverty de tout ce qu'il fait ou qu'il souffre, & generalement de tout ce qui passe immediatement en luy, dans le temps mesme qu'il agit, ou qu'il souffre".[26] The essence of spiritual substance is not Thought as Rational Reflection, for this latter is only a special mode of thought. The *sentiment interieur* is present in every *pensee*. Hence the substance that thinks is a being the essential nature of which is to perceive everything happening within itself, whether it is active or is acted upon. What the Spirit does not perceive, *i.e.*, is not conscious of, is foreign to spirit. Spirit is essentially something that perceives itself, and perceives what happens within itself, and whose being is in this perceiving. It follows that the soul thinks always.[27] Since sense-experience and reflection are equally modes of thought, La Forge is beginning where Descartes arrived. It is not the rational principle of the *Discourse*, the Good Sense or Reason which is the power of judging and distinguishing the true from the false, that is the opposite of extension, but consciousness or the states of consciousness. The opposition is the

[25] Ch. XIII, pp. 189–90.
[26] Ch. VI, p. 54.
[27] Ch. VI, pp. 54–5.

antithesis of self-consciousness and matter. The corporeal species in the brain is just that of which we are not conscious at all; it is therefore not an idea. We are conscious of a qualitied state of the self, and therefore this of which we are conscious cannot be a state of the brain or a thing. The union of body and soul is thus the union of consciousness and a nervous system.

The mystery of this most mysterious thing in creation is the attachment of conscious spirit, not to body in general, but to a particular organized body. The soul cannot be in a place. One bit of extension is as irrelevant to its nature as another. Why is it connected with a particular body? The place of the soul can mean only the fact of its connection with a certain body.[28] The body is somehow involved in the specific contents of consciousness. Why is the soul aware of just what it is aware of? Obviously, it is due to the union of the soul with its body. Desgabets states that the dependence of the soul upon the body is proved by various facts: bodily sleep affects the soul; the soul depends upon the growth of the body; if the body lack a sense-organ, it is deprived of certain states; the understanding is passive, in part at least, and must get its ideas in some way through corporeal action; and there are many other facts of similar point. But union can mean only a certain dependence; the closest union that the nature of spirit and extension permits is only this, that states of the first depend upon movements of the latter, and the reverse. The union consists "dans une mutuelle & réciproque dépendance des pensées de l'un & des mouvemens de l'autre, & dans le commerce mutuel de leurs actions & passions, soit que ce soit la volonté de l'Esprit qui est uny qu'il ait obligé à cette dependance, soit qu'un autre l'y astraint".[29] The metaphors customary in the writings of his day, such as that which compares the relation of the soul and the body to that of a pilot to a ship, are quite inadequate.

In these conditions the problem really becomes theological. The cause of the union of soul and body can be God alone. The union cannot be due to bodies. God may have employed an angel to effect it, La Forge admits, but there is no reason to think

[28] Ch. XII, pp. 179–83.

[29] Ch. XIII, p. 196. The statement is elaborated on pp. 205–13 of Ch. XIV. For Desgabets' views of dependence of soul on body, see in Lemaire, "De l'union de l'Ame et du Corps", pp. 344–45, p. 331.

so. God's will, however, is only the general cause of the union. More specifically, the causes which unite a given consciousness and its states with a given body and its states are two: the constitution of the individual body and the powers of volition pertaining to the individual soul.[30] Through the will of God, a given body and a given soul are united, and the individual constitution of each explains peculiarities in the processes of the other.

Thus through the will of God body and soul are united. And more specifically, through the will of God *this* body and *this* soul are united. However, the same power is effective in an additional sense. Body and soul, of course, do not affect one another. Efficient causality does not relate corporeal species in the gland and conscious state. The former is the occasional cause of the latter; and acts of will are occasioning causes of new forms of the motions in the animal spirits. Within the limits fixed by the constitutions of the particular soul and particular body there is a further limitation—*the constancy of the correlation between a given conscious state and a given movement of the animal spirits.* God, in short, after joining *this* body and *this* soul, could conceivably have left the career of each without systematic relation to the other. We must admire His wisdom in this respect. He could have joined to each *espece materielle,* to every form that the course of the animal spirits takes, whatever thought he pleased. This He has not done. He has rather taken into account the train of causes from the extra-organic object to the gland. Accordingly He has willed that the thought joined to a given movement of the animal spirits should be just that particular thought which *ordinarily* represents the (extra-organic) cause that makes the spirit take this form. This means that the correlation of conscious state and the movement of the animal spirits is systematic and fixed without exception. There would never be an error in taking a given sense-impression as representing a certain movement in the animal spirits. The given movement in the animal spirits, however, may arise through constellation of internal conditions in the absence of the specific extra-organic cause which usually determines the animal spirits to this movement. There is no invariable connection between a given brain-process and a certain cause

[30] Ch. XV, pp. 227–29.

affecting the sense-organs. Illusion and hallucination are possible, but relatively rare. If I am conscious of a certain shade of red, then it is certain that my animal spirits are moving in one special way. In this there is no possible failure of correlation. But my animal spirits may take on this motion even when I am not affected by that condition in the physical world which usually obtains when I am conscious of this shade. God's principle, that a given conscious state shall have one, and but one, correspondent in the series of brain-events, never fails.[31]

This is by no means a statement of psychophysical parallelism, nor even of systematic Occasionalism. The correlation of thought and brain-state is limited to sense. "Par les pensées, qui sont naturellement unies à certaines formes du cours de l'Esprits, que la volonté de l'Ame ne sçauroit séparer, i'entens seulement ces sentiments confus qui sont causez par l'action des objets sur nos sens, lesquels il est manifeste que l'Ame ne peut ny oster ny changer."[32] The connection with respect to other ideas is arbitrary. The visual or spoken word as a sense-process has a natural correlation with a particular sense-perception. But we can "attach" to the word an idea which is not at all a perception of this sense-process. The understanding as active, La Forge seems to mean, is an independent source of ideas. There are ideas which we possess because we will to think them. There are, however, some ideas and some movements which depend upon one another absolutely in the same sense that one cannot be without the other. These ideas are those ascribed directly or indirectly to sense. This is the maximum closeness of union between soul and body.[33]

It may however be objected that the distinction between natural correlation and the voluntary correlations of will may nevertheless fall within the scheme of occasional causes established by God. The understanding and will may generate an idea independently of sense. But if for every such idea there is a correlated brain-process, and this same brain-process occurs whenever this particular idea is present, the system of correspondence remains universal. Nevertheless it is clear that La Forge really means to limit the systematic correlation of idea and bodily process to the interrela-

[31] Ch. XIV, p. 217.
[32] Ch. XV, p. 225.
[33] Ch. XIII, p. 195.

tion of body and soul in and through sense. For he states quite unmistakably that there is an infinity of things of which we may think but which we cannot imagine. And we may recall in memory these very thoughts. Such pure conceptions, because they are pure and are not images, do not leave vestiges in the brain. This proves that, since we can recall these conceptions, there exists a purely intellectual memory—a point in which Desgabets seems to differ from La Forge. We must then conclude that, for La Forge, some ideas may arise, and may be recalled, without the existence of any brain-process correlated with them. In general, the situation is that, in so far as the soul generates ideas from its own intrinsic nature, not even the coöperation of the body, in the sense of occasioning cause, is necessary. But in so far as an idea cannot be accounted for save by the fact that the soul somehow dwells in an animal body, that idea implies the presence in the body of a process with which the idea is specifically correlated. La Forge's doctrine, accordingly, is neither a psycho-neural parallelism nor a complete statement of Occasionalism.[34]

IV

The function of sense-impressions in knowledge of things is thus made conceivable by a divinely guaranteed correlation of sense-idea and brain-process with respect to sense-ideas, despite the antithesis in nature of soul and body. This partial psycho-neural correlation is the very union of body and soul. In the place of a correspondence of a form apprehended by the mind with the formal component in the thing we have a constant connection between an entity in the soul and movement of the animal spirits in the brain, and less certainly and directly, a connection of the former entity with extra-organic "local dispositions". The ideas

[34] Ch. XIX, pp. 344–5. The essential difference between imagination and understanding explains why understanding has no need of organs, and is a faculty independent of body. La Forge seems to have regarded the correlation of word and thought, and of pure conception with the brain process which is the physical meaning of the word, as equally arbitrary. The only necessary connection is that between the word as movement in the gland and the sense-perceived word. Desgabets seems to differ from La Forge in his assertion that with every mental process there is always some liaison with movements of the animal spirits (pp. 343 ff.).

occasioned in the soul by its compresence with the body constitute a natural but divinely decreed symbolism for specific events in the material world. The possibility of representation is based upon the fixity of the natural symbolism.

But this is only a half of the total problem. The correlation of sense-impression and motion does not alter the fact that the sensation is confused. How then can there be knowledge, which is a matter of clear and distinct ideas, drawn from, secured by, or connected with, the confused ideas of sense? That a given sensation stands always for one and the same motions in the organism, and (with due allowance for the rôle of the organism) in the world—all this is not a knowledge of the motions themselves. How does sense-knowledge become clear and distinct? Or how do the clear and distinct ideas of understanding, independent of sense with respect to origin and significance, lend clearness to the ideas of sense? Or finally, is it possible that sense-ideas become of themselves clear and distinct? If they remain to the end confused, how can they be employed in the interests of knowledge?

The problem, of course, is that of knowledge of particular things. For the School, a thing, a substance composed of matter and form, is a unique and richly qualitied entity by means of which its specific character is defined. But La Forge has placed the bundle of specific qualities and their specific combination within the soul; nothing save extension and motion remains without. The anti-Cartesian continually maintains that, without forms and real qualities, matter as extension is perilously near being nothing at all. Even if things be local dispositions, understanding must deal with sense-impressions. Only by means of subjective sense-impressions can the ideas of understanding be directed upon things. The ideas from sense, confused as they are, are the only guides to understanding in its proposed enterprise of coming to know a world of particular things and events. The infinitude of figures, said Descartes, suffices to express the diversity of things. But *what* figures express *what* things? The difference between sugar and salt is expressible in a mathematical way; but the difference to be expressed is not the difference between a salty and a sweet taste, but some other difference, a difference of extension and motion which the tastes suggest, which the tastes symbolize, but which is not revealed in and by the sensation.

The perceptions of sense are both clear and confused. They are clear in the sense that the sensation forces us to perceive that something acts upon our body and that one impression is different from another. They are psychologically clear. With respect to their representational function they are confused for two reasons. First, they lead us to attribute to things qualities that are subjective. In addition, sensation does not picture the action of the object (*i.e.*, the motions to the pineal gland) but affords us feelings only, such as heat, which have no resemblance to the real properties of things. The sensation of heat does not represent clearly, and it gives no direct inspection of, that which is in the object itself as the property of producing the sensation of heat.[35] From sense we derive the ideas of memory and imagination (at least of the memory and imagination that have corporeal correlates), and accordingly these latter suffer from the confused character of their origin in sense.

The notion of substantial forms, of real qualities, and the like ideas, resulted from an uncritical acceptance of the world as it appears. A natural inclination leads us to project our subjective states into extra-organic things. Now we cannot prevent this projection of sense-qualities into things; but, enlightened by the Cartesian determination of what spirit and matter really are, we can recognize the true status of sense-qualities. This done, we are left with the world of objects reduced to extension and motion, while all the specific differences between things are represented in sense and imagination by the qualitative variety of the perceptual and imaginal states of the soul. The two great common denominators of things, that is, extension and motion, are given by the clear and distinct ideas of understanding. Sense will convince us of a difference between a thing that naive experience declares to be hot and a thing that naive experience declares to be cold. The clear and distinct ideas of understanding assure us that this difference is somehow a matter of differences in extension and motion. So far all of this is divinely certified and guaranteed, for the competence of reason in the field of clear and distinct ideas

[35] Ch. XVII, pp. 268–271, 272–3, 276–7. A disembodied soul—the human soul after death—will have no confused ideas of sense. It will know body, but will have no impressions of color, heat, etc. Ch. XXIV, pp. 405–412.

is assured by the fact that God is not a deceiver, and the symbolism of sense is assured by God's ordinances concerning the union of mind and body. Something remains to be discovered: we must know what motions and extensions heat-sensation points to and what motions and extensions the sensation of cold symbolizes.

In the end, La Forge is unable to resolve the question and to overcome the contrast between the clear and distinct ideas of motion and extension on the one hand and the confused representations of sense on the other. This epistemological situation is a reason why he makes a further approach towards Occasionalism. Extension and motions, as ideas of the understanding, are not co-implicative, but independent notions. Extension and motion are radically external one to the other. The essence of matter is extension, and a thing is a bit of extension. Motion is not a real property of things, and the interaction of things is not conceivable in terms of things as so defined. And incidentally, of course, to urge that the interaction of things is inconceivable furnishes a support for the inconceivability of interaction between body and soul. La Forge is clearly uneasy because the very notion of 'thing' is about to evaporate into nothingness. He must deny agency in things—a heavy body does not fall because it inherently possesses a specific power of falling or a specific quality of motion. Once more, qualitative differences are states of the spirit, and for them in the thing must be found quantitative differences. Now force and motion must be distinguished from extension, as such; but then either the former must be a mode of extension, which is absurd, or else motion and agency must be properties of incorporeal substance alone. It follows that the motions of things are due to God. Nothing in the extended thing, in its nature as extension, explains its motions. The motion of a thing is not an expression of its intrinsic character.[36] God is then the sole, the universal, and the total, cause of movement. If we assert the subjectivity of sense we deny qualitative variety of motion. Ultimately, the perceived interactions of things, the variety of motions, the falling of the heavy body and the rising of the light body, are all cases of the confused ideas of sense.

The confused character of the sense-idea is not dispelled by the

[36] Ch. XVI, pp. 242–3, 246–253.

application of a clear and distinct idea. The impression called heat remains what it is whether or not heat in the thing be a mode of motion. The clear ideas are not adequately represented in the confused ideas of sense.[37] The sense-ideas, indeed, can be nothing more than occasions for the application of the clear ideas of size, figure, extension, and movement. La Forge, who is unable to explain the technique which understanding is to follow in utilizing these occasions, feels that even the confused character of sense-ideas must be justified in terms of God's providence. The reason for this confused character of sense-ideas is the soul's inability to perceive the minuteness and delicacy of the nerve-fibres, and the size, movement, and figure, of the motions that go on within them. That is to say, a constellation of minute effects in the brain is necessary to provide an 'occasion' sufficing to lead the soul to perceive that the body has been effected. It might be thought that it would be better were the soul able to intuit directly the motions in the nervous system, not in sum but in detail and separately. But the lack of this capacity is proof of the providential arrangement of things. If the motions in the nerves were directly apprehended, so that the thought of such motions would be present in the soul upon the occasion of the motions rather than a sense-feeling, then the soul would relate its experiences with the brain or the gland and with this alone, rather than with the body as a whole. Did this occur, the soul could not take cognizance of the welfare of the body as a whole; the world, for the soul, would in effect shrink to the pineal gland, for the soul would be joined to the gland and to nothing more. The confusion of the sense-impression is therefore the reason why the soul is attentive to the career of the body amid a world of things.[38]

Knowledge—scientific knowledge—of nature in its details involves three factors: the clear and distinct ideas whose source is the pure understanding; the confused ideas of sense as occasions for the employment of the former; and things as nuclei in the universal field of extension. In two ways knowledge depends upon God. In the first place, the systematic correlation between the terminal brain-motions and the sense-experience itself, which

[37] Ch. XVII, p. 272.
[38] Ch. XVII, pp. 274–6.

insures the connection of body and soul, makes possible the soul's concern with the welfare of the body, and serves also to point beyond the body to the world of things. The systematic correlation guarantees that sensations are symbols for fixed values. The objective applicability of the ideas of understanding, and of mathematics, not to extension as such, but to the events and things in a world-order, depends upon this constancy in the symbols. Again, since motion and extension are independent variables, and since perceived motions are part of the qualitatively varied confused impressions of sense, the relevance of the clear idea of motion to the apparent motions of things depends upon God. Motion as a universal idea, with the possibility of quantitative statement, is applicable in nature only because God, as cause of motion, guarantees in the (apparent) interaction of things a set of occasions which is reliably systematic.

Thus the Cartesian dualism renders substantial forms and intentional species meaningless. The facts that suggest these ideas are discovered to be, not at all items in an objective world, but subjective impressions within the things that think. Substantial forms, from the point of view of the Cartesian La Forge, do not constitute a subject-matter but a system of symbols for a subject-matter. And this latter is known only when it is apprehended as quantity and given exact statement through the pure ideas of understanding. That which is clearly and distinctly understood is true. Through divine providence we have innately the ideas of the nature of matter, of spirit, and of the relation between these two. In all of this there is nothing hypothetical. If there be a place for hypothesis, we must assume, that place is defined by the task of discovering exact values in terms of extension and motion for the natural symbolism of the confused ideas of sense. All agency, all qualitative variety, is removed from the physical world by the Cartesian determination of what matter is and what spirit is, and science is possible.

The dualism of matter and spirit, if it makes possible a science of nature, defines at the same time a subject-matter for the science of mind. Substantial forms, intentional species, and real qualities, are indeed not the subject-matter of physical science. The apprehension of those who, like Desgabets' correspondent, think that

matter without forms and real qualities is equivalent to nothing and physical knowledge has no subject-matter is unnecessary. For the subject-matter which they had naively believed to be the subject-matter of physics has not vanished in disappearing from physics; it has become the subject-matter of psychology.

These are the truths that all men may perceive if they will but dispel the prejudices that have obscured the natural light, and if they will free themselves from their enslavement by the authority of Plato, of Aristotle, of Epicurus, or of any other philosopher. For it is shameful to submit to the authority of a philosopher when that philosopher is not sustained by reason; but it is honorable and advantageous to a man of good sense to submit to the dominion of reason, even if it be not sustained by any authority whatever.[39]

ALBERT G. A. BALZ

UNIVERSITY OF VIRGINIA

[39] P. 452.

SPACE, TIME, AND GOD

A Chapter in Eighteenth-Century English Philosophy

SPACE and time had emerged in the English philosophy of the seventeenth century from the work of More, Barrow, Newton, and Locke. While it is not the purpose of this paper to account for this emergence it may not be out of place to summarize the more important features of these new entities.[1] By the close of the seventeenth century, English thought had acquired two great summations, the *Principia* and the *Essay*. In the former a definitive answer was given the problems of natural philosophy. Nature was interpreted in terms of space, time, and mass, and these terms were absolute. The changing positions of unchanging particles in an absolute space and an absolute time provided an explanation of the phenomenal. And since by the definition of the term change could be expressed in the language of mathematics such a degree of rigor was attained that the Newtonian cosmology seemed complete in itself. Of equal importance was the investigation of the limits and extent of knowledge in such a world. What could we know of phenomena and how far could our knowledge extend into the realm of Newton's scientific objects? The solution given involved three classes of things and their relations. Newton's logical ultimates are known by our ideas of primary qualities, while ideas of secondary qualities give knowledge of the relative or phenomenal. The system of absolute particles is preserved as the efficient cause of a second set of entities called ideas. Between these two entities subsists an intransitory relation, for ideas are representative of primary and secondary qualities. The third entity, mind, does not enter our discussion.

The self-consistency of Newton's system raised an important problem both for Newton and for Locke. It was necessary for Newton to show how it was possible for God to have a place in this world of absolute particles in absolute time and space. From

[1] Concerning the nature of this emergence see my paper in *Columbia Studies in the History of Ideas*, Vol. III.

these absolute entities Locke obtains the same theological problem and another pertaining to his theory of knowledge. This latter resolves itself into demonstrating the plausibility of a relational epistemology with respect to an absolute metaphysics. The Newtonian physics proved so harmonious with *a priori* mathematical proof that God and knowledge as empirically understood were in danger of exclusion. Since we are not dealing with Locke's epistemology, we shall confine our statements to their efforts to *relate* God to the universe. Their attempts to solve this problem introduce the eighteenth-century material which we are to study.

From the philosophies of More and Barrow space and time emerged as God's attributes. In his theories of absolute space and time as the locus for a mathematical description of change, Newton reaffirms these older notions, easily accessible to him in the works of his Cambridge predecessors. Space gives the presence of God as extended, time, His presence as duration.[2] Those entities which are equally fundamental with matter are attributes of God. Newton realized this virtual pantheism and replied that God's attributes were not exhausted as space and time. Locke advances practically the same opinion. The history of his thought on these topics as it appears in his *Commonplace Book*[3] is an epitome of English speculation on space and time during the fifty years preceding the *Essay*.[4] His final conclusions repeat the Newtonian opinion as derived from More and Barrow.

As formulated by the chief authorities for eighteenth-century natural and mental philosophy space and time are absolute, divine, empirical, existing objects. They are known in sensation, they are the necessary, universal framework of physics, and they demonstrate the real presence of God. A godless self-sufficiency of nature is avoided in that the most necessary background of knowledge and science is the spatial and temporal attributes of divinity.

Samuel Clarke (1675–1729) appears to be the first professional theologian to attempt an interpretation of God's attributes in the

[2] *Cf. Principia*, trans. by Motte, London, 1729, Vol. II, pp. 389–390, and *Optics*, 3d ed., London, 1721, pp. 345 and 379.

[3] King, *Life of John Locke*, London, 1829, pp. 62–63, and 329–335.

[4] Locke, *Essay*, Bk. II, Ch. 13, sec. 27, and Ch. 15, sec. 2, 3, and 8.

light of the new science.[5] In 1704–05 he delivered a series of lectures under the recently established Boyle foundation, publishing his work later as *A Discourse Concerning the Being and Attributes of God*. In Proposition III, which seeks to prove God's necessary self-existence, the argument mentions the necessity of our idea of immensity. But it is contradictory not to postulate a being or substance in which the attribute of immensity inheres. The reality of this attribute is assured, for:

> To suppose any part of space removed, is to suppose it removed from and out of itself. And to suppose the whole to be taken away, is supposing it to be taken away from itself, that is, to be taken away while it still remains, which is a contradiction in terms. There is no obscurity in this argument, but what arises to those who think immense space to be absolutely nothing, which notion is itself likewise an express contradiction, for nothing is that which has no proportion or modes whatsoever. That is to say, it is that of which nothing can truly be affirmed and of which everything can truly be denied, which is not the case of immensity or space.[6]

The inference follows that space is real and may be understood in the Newtonian sense. From the necessity of space is inferred the necessity of God; for a necessary attribute implies a necessary substance. But Clarke wishes to protect in mystery God's essence and repeats the Lockian opinion of the unknowableness of substance.

> Infinite space is nothing else but abstract immensity or infinity, even as infinite duration is abstract eternity. And it would be just as proper to say that eternity is the essence of the supreme cause as to say that immensity is so. Indeed they seem both to be but modes of an essence or substance incomprehensible to us.[7]

It is obvious that these opinions reflect the work of Clarke's two great contemporaries, and such notions seem important as one of the first English indications of the assumption by theology of the results of science and philosophy. Locke's *Essay* was a summation of English empiricism in contrast to the rationalism on the

[5] There is a large group at the close of the seventeenth and the beginning of the eighteenth centuries who treat primarily of Newton's physics. But even these men, *e.g.*, Keill, Pemberton, Raphson, and Cheyne, partially repeat Newton's space-and-time theology. They are omitted here since they only mention and are not concerned with the development of this problem.

[6] Clarke, *Discourse*, 7th ed., London, 1738, pp. 16–17. With regard to the first sentence Clarke refers to "Newton, Princip. Lib. I Schol. ad Definit. 8".

[7] Clarke, *Discourse*, p. 39.

Continent. Newton made use of an empiricism founded on the necessary rationalism of mathematics. Clarke seems to be attempting a reconciliation of these methods for the uses of theology. God's essence is unknowable like Locke's substance, yet may be known by its relations to mind just as ideas gave knowledge of primary and secondary qualities. Attributes are substituted for qualities, and in the relations of attributes to mind some notion is formed of reality. By this inference of reason and in the theory which makes such a function of reason possible is implicit the *a priori* tendencies of the Newtonian cosmology. Mathematical deduction could yield results accurate as descriptions of change in nature. A reason which is adequate for physics may prove equal to a deduction of God's existence. If space and time are revealed to us by Locke's empiricism but are necessary by Newton's rationalism, have we not here, Clarke may be imagined to have thought, a means for a knowledge of God which can satisfy both sense-experience (the relative) and intellect (the absolute)?

Clarke continues to discuss this matter in five letters composed in 1713 which together with two undated letters terminate this period of the speculation.[8] The arguments may be summarized as follows. To the objection that space is not a thing but 'affection of thing' and if necessary does not need the necessity of God,[9] Clarke answers that it is the *sine qua non* of all things, while God is the *sine qua non* of space, time, and things.[10] Space is not an attribute of all substances,[11] because substances other than God are in space while God is the ground of space.[12] It is stated in reply that we have no idea of such a relation and this gives equal necessity to God and space. If the necessity of space is derived from God, we assume what is to be proved.[13] But

[8] *Several Letters to the Reverend Dr. Clarke from a Gentleman in Gloucestershire . . . with the Dr's Answers thereunto.* Bound with the Discourse, 7th ed., and the pagination continued. The two undated letters to an unnamed correspondent follow the above in this edition. The "Gentleman in Gloucestershire" is Joseph Butler, author of *The Analogy of Religion.* Butler at this time was in Tewkesbury Academy in Gloucestershire. For a modern edition of this correspondence see Gladstone's edition of Butler's *Works,* Vol. I, pp. 339–357. Vol. III, pp. 123–128, contains Gladstone's analysis of these letters. He seems entirely unaware of the origin of this discussion in Clarke's knowledge of Newton.

[9] *Letters,* p. 467. [10] *Letters,* p. 470. [11] P. 472.

[12] P. 474. [13] P. 477.

Clarke insists that space is an abstract idea and no substance. While 'necessary' its necessity is less than the necessity of God.[14] The discussion ends when the "Gentleman in Gloucestershire" remarks the possibility of "disimagining" the "substratum of space" but not space. If this means disimagining God such a result is absurd.[15] Clarke takes literally this rhetorical use of absurdity and believes his correspondent has answered himself.[16] There is no new material in letters six and seven.[17]

This discussion raises more problems than it solves, but is of primary importance as hinting at the nature of the problem. The materials of the disagreement are the relation to God of space and time. At this date (1713) it is not suggested that the general plan of Clarke's attempt is unsatisfactory. The nature of God is assumed by both to be subject to deduction, only they differ in the extent to which they would apply their rationalism. Clarke's opponent appears more influenced by Locke and objects to the absence of clear ideas of the entities and relations in question. Clarke tries to accept all this yet reconcile it to the *a priori*. Later we shall see more insistence on the mysterious and ethical nature of God and His attributes. So far the argument turns on a treatment of God's physical manifestations.

In a sense this is but an introduction to Clarke's main attempt to establish his notions of space and time; the well-known discussion with Leibniz in 1715–16.[18] It is important to recall that the discussion originated from an interpretation of Newton by Leibniz in a letter to the Princess of Wales.[19] At the request of the Princess, Clarke attempted a defense.[20] Five letters were composed by the two disputants and the discussion lasted until Leibniz' death in 1716. In his first letter Leibniz refers to Newton as saying

> . . . space is an organ, which God makes use of to perceive things by. But if God stands in need of any organ to perceive things by, it will follow that they do not depend altogether upon Him nor were produced by Him.[21]

[14] P. 480. [15] P. 482. [16] P. 484.

[17] Pp. 486–502.

[18] Clarke, *A Collection of Papers which passed between . . . Mr. Leibniz and Dr. Clarke*, London, 1717.

[19] *Collection*, p. v. [20] P. iii.

[21] P. 3. *Cf.* Newton, *Optici*, 1st Latin ed., London, 1708, p. 315, and *Optics*, 3d English ed., London, 1721, p. 345. The basis for this passage does not

Clarke replied that Newton only means that God as

> . . . omnipresent perceives all things by His immediate presence to them in all space wherever they are without the intervention or assistance of any organ or medium whatsoever.[22]

With this beginning it is Clarke's intention to refute the Leibnizian theory of a relational space and time and show that they are real existing entities which express the infinite extension and duration of God. At this time Clarke emphasizes as his proof of this real existence an argument previously favored by Newton. This depends upon the usual distinction between the different kinds of motion. In his fourth letter to Leibniz the point is developed that

> The motion of the ship, though the man perceives it not, is a real different state, and has real different effects, and upon a sudden stop, it would have other real effects. . . . To this argument no answer has ever been given. It is largely insisted on by Sir Isaac Newton in his *Mathematical Principles* (Definit. 8) where from the consideration of the properties, causes, and effects of motion, he shows the difference between real motion, . . . and relative motion.
> The reality of space is not a supposition but is proved by the foregoing arguments. . . .[23]

But as before this real space and real time are viewed as God's attributes.

> Space void of bodies, is the property of an incorporeal substance. Space is not bounded by bodies, but exists equally within and without bodies. Space is not inclosed between bodies; but bodies, existing in unbounded space, are themselves only terminated by their own dimensions. Void space is not an attribute without a subject, because, by void space, we never mean space void of everything, but void of body only. In all void space, God is certainly present, and possibly many other substances which are not matter. . . .
> Space is not a substance but a property, and if it be a property of that which is necessary, it will consequently . . . exist more necessarily . . . than those substances themselves which are not necessary. Space is immense and immutable and eternal, and so also is duration. Yet it does not at all from hence follow that anything is eternal *hors de Dieu*. For space and duration are not *hors de Dieu*, but are caused by, and are immediate and necessary consequences of His

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appear in the first English edition, London, 1704, but I am told is in the second English edition, London, 1717, second issue 1718. From the dates it seems clear that Leibniz refers to the first Latin edition. We know that Clarke made this translation; so there is a possibility that this notion had its origin in Clarke or was even written by him. Even so, the passage appears to have had Newton's approval since it appears in the later editions.

[22] *Collection*, p. 11. *Cf.* Newton, *General Scholium*.

[23] *Collection*, pp. 133–135.

existence. And without them, His eternity and ubiquity (or omnipresence) would be taken away.[24]

In these quotations we have a summation of all that Clarke had to say on this question. Although the letters are primarily a defense of Newton's ventures into philosophy and theology there is no evidence that his champion had not made this interpretation of space and time his own. There is of course an appeal to the authority of Newton for a substantiation of this particular application of physics to theology. But the development of the application is Clarke's. Space and time are real things that serve two purposes. As empirical objects they make clear to sense-experience the real presence of God's attributes. From their *a priori* necessity they provide propositions for deducing the necessary and eternal existence of God. Religion is to be founded upon the most comprehensive scientific entities. To Clarke's contemporaries no insight into nature seemed more certain and true than Newton's *Principia*. If natural religion could be placed on as firm a foundation as natural science and if the two could be shown to embrace the same entities then 'atheism' and 'free-thinking' would be crushed. This explains in some measure the neglect of Locke. The empiricism of the *Essay* afforded little sanction for Clarke's deductive method. Locke could be quoted as an authority who agreed with Newton, but the positive results of his work had already given the "Gentleman in Gloucestershire" arguments that damaged the invocation of substance and substratums.

Between 1717 and 1731 two volumes were issued that have a bearing on the connexion of God with space and time. Samuel Colliber (*fl.* 1718–1737) published in 1718 *An Impartial Inquiry into the Existence and Nature of God*. Remembering Locke he defines distance as the relative idea of space between two points.[25] Given this idea the mind forms a simple abstract idea of space which is absolute in contrast to the idea of distance which depends upon two or more located objects. But from the simplicity of the idea of space arise difficulties of exposition.[26] However, he attempts the defense of three propositions:

[24] *Ibid.*, pp. 127–131. [25] *Impartial Inquiry*, p. 212. [26] *Op. cit.*, p. 213.

1. Space is absolutely infinite.
2. Space is real and distinct from body.
3. Space is necessary to being in general.[27]

After a short discussion of the first point, in which the customary anti-Cartesian arguments are advanced, Colliber concludes that to avoid the multiplication of entities making space separate from both matter and spirit it is more "Christian like" to believe that immaterial extension is God who pervades all.[28] This does not mean parts in God, for distance between parts of space is only space.[29] Also, this space is just as necessary as Clarke had concluded.

> Expansion in the larger sense of the word ought not to be reputed (as usual) to be merely accidental to being in general but that it is to be esteemed the very fundamental notion of all things (or substances) without which no imaginable properties can be conceived to exist with the absence of any particular property whatever, which is certainly the case of expansion or space.[30]

Between 1704 and 1731 there is another example of dissent who may be grouped, for our purpose, with the "Gentleman in Gloucestershire". William Wollaston published in 1722 the once famous *Religion of Nature Delineated* and took issue with the opinion that space is real and divine. He suggested that

> Space taken separately from the things which form and fill it is but an empty scene or vacuum; and to say that infinite space is God, or that God is infinite space, is to say that He is an infinite vacuum; than which nothing can be more absurd or blasphemous.[31]

Likewise, time does not exist in and for itself; it serves only as measure and is no entity in its own right.[32] The basis of Wollaston's objection is more obvious than in the former case. The general purpose of his volume was to call attention to God as the source of universal morality. Such an interest does not demand God's omnipresence and eternity in the same sense as Clarke had demonstrated them. Although there is little to choose between the dogmatism of the two men, and both attempt the same method, Wollaston begins his discussion with moral law. The necessary existence of God is completely mysterious in physical terms, and

[27] *Op. cit.*, p. 214. [28] *Op. cit.*, p. 218. [29] *Op. cit.*, p. 224.
[30] *Op. cit.*, p. 226. [31] *Religion of Nature*, 6th ed., p. 74.
[32] *Op. cit.*, p. 75.

materiality is denied equally with other scientific concepts. In no way does this detract from the dignity of the divine reason. God is still the source of all harmony and order. The emphasis has simply been shifted from scientific or physical perfection to the necessary perfection of the good.

What we have said so far represents the state of opinion to 1731. Clarke and Colliber have been lightly criticized and English theology has shown itself peculiarly amenable to the definitions of science. But a change was at hand, although this does not mean a repudiation of science as a means to discovering truths about the natural order. In its immediate concerns the new opinion only attempts a disproof of the presumed alliance between God and space and time. The object of the attack extends no further than a denial of the reality of space and time as absolute. If they can be proved relational or 'mental' their claim as God's attributes has been destroyed to the satisfaction of this eighteenth-century religious philosophy. The criticism might have penetrated more deeply, reaching the conclusion that in the absence of absolute space and time the foundation of Newtonian mechanics had been disturbed. However, the men we are to consider now represent far more completely theological in contrast to scientific purposes.

Viewed as a part of the history of philosophy the subsequent events in our 'chapter' seem initiated most accidentally. William King (1650–1729) had published in 1702 his *De Origine Mali*. This was translated in 1731 by Edmund Law (1703–1787) as *An Essay on the Origin of Evil*. To his translation Law added many notes, some of which present a theory of space originating in a criticism of Samuel Clarke's *Discourse*. Apparently King's work was neglected by the theologians we have considered, for although he separated space from matter no reference is made to his opinion that "space is as distinct from matter or body as wax is from the colors successively received and does not depend on them any more than wax does on any particular form".[33] The nature of space is difficult to determine, but it seems certain that "space (as we conceive it) be something extended, immovable,

[33] King, *Essay on the Origin of Evil*, trans. by Law, 2d ed., London, 1732, p. 9.

capable of receiving or containing matter, and penetratable by it".[34] Since "philosophers are not agreed" King is reluctant to call this space real and existent; at least we have an idea of it.[35] More certainty is expressed on the question of necessity, and he suggests that we connect necessity to the existence of space "merely out of prejudice", because in considering anything other than ourselves this other thing always appears 'outside' of us.[36] If "by a reflex act we view the mind itself and its operations" we shall see that "nothing of extension or space offers itself in these, nor does the mind when employed about them think at all of space nor is it conscious that it occupies space".[37] So King would deny Clarke's necessity from the results of introspection and never connect this notion with God or His attributes, for there is nothing of activity in space.[38] As we said above, Law's commentary on Chapter I of his translation begins a new stage of discourses on this problem. Samuel Clarke had died in 1729, so his nephew John Clarke undertook to answer Law's criticism of the space-and-time philosophy of the *Discourse*.[39] In reply to John Clarke, Law added a postscript to the second edition of his translation of King and republished in 1732 his original translation and notes with this new material. John Clarke answers in a second pamphlet where he attempts to refute the arguments in the postscript of 1732.[40]

Since there is hardly space for a detailed analysis of the *Notes, Postscript,* and two *Defenses,* we can attempt but a general account of the two positions. Law's criticism of Clarke originates in an interpretation of Locke's remarks on the origin of our ideas of space and time.[41] We derive our ideas of space by

> . . . observing that all bodies agree in being extended, as well as solid, though they differ never so much in magnitude and figure, we take the former of these properties apart from the latter, as also from any particular magnitude or shape, and call it extension in the abstract; which being thus made general it will comprehend all particular extensions and may be enlarged every way and am-

[34] King, *Essay*, p. 9. [35] King, *Essay*, p. 25–26. [36] King, *Essay*, p. 32.
[37] King, *Essay*, p. 40. [38] King, *Essay*, p. 44.
[39] John Clarke, *A Defense of Dr. Clarke's Demonstrations of the Being and Attributes of God*, London, 1732.
[40] John Clarke, *A Second Defense of Dr. Clarke's, etc.*, London, no date but either 1732 or 1733.
[41] Locke, *Essay*, Bk. II, Ch. 13–14.

plified *in infinitum*. We can conceive it as existing beyond the limits of body, and by adding the confused idea of a substratum to it, it will become independent and serve both as a common measure and a common receptacle for all bodies, which probably constitutes our idea of space.[42]

Our idea of time originates in similar fashion and shows again Locke's influence.

Observing a train of ideas succeeding one another in our minds at certain distances and being conscious that we ourselves exist while we receive them, or that our own existence is commensurate to this succession we get the idea of continuing. Observing also that several other things continue as well as ourselves, we find that the same affection belongs to them; but it being an endless work to form as many distinct ideas of this kind as there are things that thus continue, we abstract from particular existences and make one general idea of continuance, which serves for all, and this is duration.[43]

If our ideas of space and time are formed in this way we must inquire next into the nature of these abstract ideas.

[They] exist under that formality nowhere but in the mind, neither have they any other foundation, nor can they be a proof of anything, besides that power which the mind has to form them.[44]

If we attempt to consider space as thing it reveals itself as nonentity, for nothing can be affirmed of space but everything denied. It is an abstract idea formed by mind from the contemplation of matter as extended. Extension can no more be taken as possessing properties than it can be considered as applicable to God's attributes.[45]

From the passages quoted it is apparent that Law has assumed a nominalistic view in keeping with the text he translated and annotated. The authority of Locke is invoked to account for the origin of our knowledge of space, but Locke's opinion on the nature of scientific objects as the cause of empirical objects is not called in question. This appears as a typical use of the *Essay*. To the extent that Locke failed to adjust his relational theory of knowledge to Newton's absolute metaphysics it was possible to apply either part of Locke to the solution of traditional problems. Clarke read Locke and neglected his empiricism, for it was possible to emphasize the connexion of Locke's rationalism with the same rationalism in Newtonian physics. Law, however, argues from

[42] Law, trans. of King, 2d ed., 1732, note 1, p. 6.
[43] Law, note 1, p. 6. [44] Law, note 1, p. 7. [45] Law, note 3, p. 10.

the other passages to refute Clarke. Neither seems to realize the difficulties in their joint authority and his inconclusiveness if he can support both.[46]

As seems natural, John Clarke depends on the authority of his uncle, and the arguments we are to examine now are a practical repetition of the *Discourses* and *Letters*. We may begin with an appeal to Samuel Clarke about space and then see the obvious extension of the conclusions to time.

> That Dr. Clarke asserts space to have real qualities is true. But then he does not consider it strictly as a property but as its own substratum; that is, considering these properties, which he applies to space as being truly and really inherent in that which is the substratum of space, as for instance, penetrability, immobility, indiscerptibility, and infinity are strictly properties of the infinite being to whom space belongs. But then they are such properties as could not pertain at all to that infinite being, without space was a property of Him also. . . . Space is the extension of expansion of that infinite being.[47]
>
> The same of time as was of space. It is not time or duration that endures but the substratum of duration; for duration is only enduring and what can enduring be without something to endure? For as duration is no substance there must therefore necessarily be some substance to which it belongs. . . . Duration is as I said before, a continual flux which was and always is the same. It is the uniform perpetual flowing of the existence of the Deity. It neither does nor can possibly depend at all upon the succession of ideas in any person's mind, whatever.[48]

Later, he adds that if space is unreal so time. But it is possible to distinguish time from space, and since two nonentities would be identical time and space are real. Space is more than an abstract idea in the mind, because Locke defined it as simple and simple ideas have external reference. It follows that space cannot be relational or bodily extension, for ideas of relations and bodies are complex. But space and time are not substances by the equal necessity and infinity of both, yet could be called substances were a plurality of infinite substances not contradictory.[49]

It is easier to imagine the discussion ending here than to realize that it continued. Law in translating King was doing a rather obvious kind of work, calculated to win some renown for a young

[46] Clearly it is here that Berkeley made one of his contributions in attempting to solve this difficulty. With one exception, there is no evidence that any of our authors were acquainted with the future Bishop of Cloyne.

[47] John Clarke, *A Defense of Dr. Clarke's, etc.*, London, 1732, p. 49.

[48] John Clarke, *op. cit.*, p. 50.

[49] John Clarke, *op. cit.*, pp. 61–64.

clergyman; he was then about 28. John Clarke's answers reflect more family pride than desire to achieve theological position, although it is true his interest in Newton gives some explanation.[50] The situation seems more accidental than necessary in the history of English thought, and might have been expected to cease at any moment. Each has been loyal to his own set of traditions. Law presents the opinions of King modified by reading Locke; John Clarke returns to the thoughts of Samuel Clarke on Newton. An end of the matter might have occurred but for the entrance of a new contestant, Joseph Clarke (d. 1749). Very little is known of Joseph except that he resided at Cambridge and was not related to either Samuel or John. He wrote in 1733 a pamphlet in two parts where he defended Law and answered John Clarke.[51] In the same year (1733) John Clarke responded with his last or *Third Defense of Dr. Clarke,* which is a detailed attack on Joseph's contributions. This we may call the second stage of the problem, but since John Clarke offers no fresh material in the *Third Defense* we shall condense the account to a summary of Joseph Clarke. His arguments develop from an examination which shows space devoid of properties.

> We deny then that any property, attribute, etc. is applicable to space. And we think it is equally improper to say, that space has a property of receiving body, as to say that darkness has a property of receiving light and silence a property of receiving sound, etc. Space indeed is a void, in which body may exist; or to speak more properly, where there is space, i.e., no body existing now, there it is possible for a body to exist. But that body may exist is not from any positive property which space has, or is endued with, of receiving it; but from nothing being there to hinder it; and from space not being indued with any property whereby it can exclude it from existing.[52]

If space lacks properties it is misleading to speak of it as necessary and then argue from this necessity to existence.

> As to its [space] being presupposed to the existence of everything which is to exist in it, it is sufficient to say the presupposition of space does not prove the

[50] *E.g.,* his father, John Clarke (1682–1757), published *A Demonstration of Some of the Principle Sections of Sir Isaac Newton's Principles, etc.,* London, 1730.

[51] Joseph Clarke, *Dr. Clarke's Notions of Space Examined,* London, 1733. Part I answers John Clarke's *First Defense,* Part II the *Second Defense.* Law's *Notes* and *Postscript* are defended. Both Law and Joseph Clarke seem to have been at Cambridge, and internal evidence in Law's *Notes* indicates that they were friends.

[52] Joseph Clarke, Pt. I, p. 27.

pre-existence of it. The absence of one body must be presupposed to the presence of another body in the same place; but yet the presupposition of the absence of one body does not make the absence of one body something really existing.[53]

This denial of properties and necessity enables Joseph Clarke to answer John Clarke on the question of space as a divine attribute. The answer consists in denying that either God or space has these properties,[54] and that if we treat space as necessary it becomes an attribute of God; an argument that misses the point for John Clarke.[55] Space and time have no existential relatum to which they may be referred, the same conclusion in fact advanced by Edmund Law.[56]

Again the discussion might have ceased at this second stage had not a new writer contributed his arguments toward a solution. In 1734 John Jackson (1686–1763) published *The Existence and Unity of God, etc.*, which we shall use to mark the third stage in this period. In this volume Jackson is interested in defending John Clarke's three pamphlets and in refuting Law's *Notes* and *Postscript* and Joseph Clarke's *Examination*. To answer Jackson, Joseph Clarke wrote in 1734 *A Further Examination of Dr. Clarke's notions of Space* in which he considers also the *Third Defense* (1733) of John Clarke. Law was again drawn into the quarrel and issued in 1734 his *Inquiry into the Ideas of Space, Time, etc.* This little volume brings together the material of the *Notes* and *Postscript* and replies in detail to each and all of Jackson's arguments. We shall omit a discussion of Clarke's *Third Defense* and Joseph Clarke's second *Examination* on the grounds that they are repetitious. This restricts our study of the third stage to an examination of Law and Jackson, and we shall find in their work the clearest summation of the entire period after 1731. The arguments are now somewhat codified and a comparison of their points of view is made easier.[57]

[53] P. 38. [54] P. 47. [55] P. 47.

[56] Joseph Clarke, Pt. 1, pp. 83–85. *Cf.* Pt. 1, p. 33, and Law, trans. of King, 2d ed., 1733, note 3, p. 10.

[57] Jackson, *The Existence and Unity of God, etc.*, London, 1734. Law, *An Inquiry into the Ideas of Space, Time, etc.*, London, 1734. Numbers at the end of the arguments refer to pages in the respective volumes.

John Jackson	*Edmund Law*
1. Space and time are simple ideas. Thus they have objective relations. Therefore space and time are real (pp. 36, 63).	1. Space is not a simple idea, for it is essentially *partes extra partes* (pp. 33–38).
2. Ideas of space and time force their existence upon us. Therefore their existence is positive and necessary (pp. 57, 71).	2. Space and time are not necessary for God. Furthermore, we cannot argue from necessity of ideas to necessity of existence (p. 45).
3. Space and time have real properties. Therefore they are real (pp. 57, 77–81).	3. The dimensions of space are 'ideal' not 'real' (p. 49).
4. Space and time are infinite. No ideas are infinite. Therefore space and time are not ideas but real attributes (pp. 57, 83, 86).	4. The reality of space and time must be proved before we can discuss their infinity (pp. 54, 58).
5. Space is necessary for motion (pp. 57, 89).	5. The idea of space and the idea of motion are not necessarily connected (p. 66).
6. If the space between the two sides of a room is nothing, the two sides would not remain separated (pp. 57, 79, 92).	6. Space is but the absence of body, so the difficulty is paradoxical (p. 76).
7. If space is nothing, then if God moved the whole world in a straight line it would always be in the same place (pp. 57, 93).	7. In natural philosophy the distinction between relative and absolute motion is legitimate. In metaphysics there is only relative motion (pp. 69–74).
8. If time is nothing, there are no differences in ages, *e.g.*, a child is as old as Methuselah (pp. 58, 95).	8. Argument similar to the preceding (p. 84).
9. If time is nothing, then even if God created the world sooner than he did it would be no older (pp. 58, 95).	9. Criticism of the meaning of 'sooner'. The idea of time is a relative idea (pp. 86–88).

There is little more to add, for after the above interchange of opinion the contestants appear to have nearly exhausted their store of speculations.[58] It is worth noting if only for completeness two other contributors to the discussion after 1731. In 1733 Isaac Watts (1674–1748) the well-known hymn-writer, published a volume of *Essays*.[59] The first essay in this collection serves to classify Watts as sympathetic to the cause of Law and Joseph

[58] Jackson replied to Law with *A Defense of a Book, entitled, The Existence and Unity of God, etc.*, London, 1735. I have not been able to see this pamphlet.

[59] *Philosophical Essays on Various Subjects*, London, 1733. Essay I, "A fair inquiry and debate concerning space, whether it be something or nothing, God or a creature."

Clarke. Although he presents his case with as much acumen as any of his colleagues or opponents he fails to place the matter in a new light. He has been omitted here because his *Essay* was neither written as an answer to previous pamphlets nor answered in subsequent writings. The second addition to this literature is the correspondence between Jackson and William Dudgeon (*fl.* 1737–1765). This comprises twenty-four letters composed between 1735 and 1737, and published in 1737.[60] Dudgeon dissents from Jackson's *Existence and Unity of God,* and although some passages are relevant to space and time the questions and arguments do not differ from those recounted previously.

So far as I can discover this brings to a close the eighteenth-century English theological implications of space and time.[61] As mentioned above, the pamphlets written on the two sides stick closely to their point and do not investigate in a wider setting the problem left by Newton and Locke. Quite clearly, the difficulty arises from the interpretation that Samuel Clarke gave to his reading of Newton and the possible advantages to be gained from Newtonian science for theology. How it was possible for him to find this material in Newton has been suggested before. It seems manifest that he and his followers were of the opinion that given the opportunity it was to the advantage of theology to employ in so far as it could the results of the new science. It is here that a larger question arose. To what extent was it expedient and necessary for religious philosophy to take into account natural philosophy? In this question is found the setting for the smaller question which it has been the purpose of this paper to examine. The immediate difficulty is the nature of space and time as they may or may not be related to God as His attributes. This we may say provided the materials of the argument. But the argument seems to be about something else; the relation between religious

[60] William Dudgeon, *Several Letters to the Rev. Mr. Jackson . . . with Mr. Jackson's Answers.* London, 1737.

[61] Mention is due Andrew Baxter (1686–1750), whose *Inquiry into the Nature of the Human Soul,* London, 1733, contains short passages showing that he favored Samuel Clarke. See notes on pp. 326, 354–355, 3d ed., 1745, Vol. II. Baxter is the exception who read Berkeley. Andrew Baxter (1686–1743) in *The Philosophical Principles of Natural and Revealed Religion,* Glasgow, 1748–49, Vol. I, pp. 57–66, disagrees with Samuel Clarke, etc. However, his work is primarily interesting as an unintelligent attack on Spinoza.

and scientific standards, definitions, and results. From this point of view King and his supporters represent a more 'conservative' opinion than Samuel Clarke and his group. Religious problems form an unique class, and any attempt to connect such problems with scientific ones confuses the issue and damages the claims of the spiritual. The nature of the damage is never clearly stated, but there is suggested a belief that God's essence is not as subject to rational approach as Samuel Clarke's *Discourse* endeavors to suggest. Any effort to deduce space and time as divine attributes misses the real understanding of God and places Him in a context foreign to His nature. Such an attitude as this seems fairly evident in King [62] and contrasts sharply with the rationalistic temper of Samuel Clarke's treatment. It is not easy to draw similar conclusions for Jackson, John Clarke, and Joseph Clarke. Their efforts are devoted to proving a thesis, and the writings we have mentioned bear too firmly the marks of controversy to leave room for wider indications of belief. There is at least a high degree of probability that they express also the feelings of the two leaders they followed.

Of next importance to Newton is Locke as an authority in argument. That the *Essay* could be a 'source book' for both factions is surprising only if Locke is forgotten. Within his work can be found both a relational and an absolute theory of space and time as well as a formal if not real choice to be made by the reader. These theologians made their own selection in accordance with the conclusions they hoped to establish. They fail to notice the more subtle problems of a theory of knowledge and they do not find Locke relevant for a solution of the connexion of scientific categories to religion. In spite of their many failings in grasp of the problem they were attempting to solve, as well as in the quality of thought brought to bear on that problem, they claim notice as a fairly unique English philosophical phenomenon.

JOHN TULL BAKER

SARAH LAURENCE COLLEGE

[62] *Cf. Sermon on Predestination* in King's *Sermons*, ed. by Whately, London, 1821, pp. 8, 19, 21.

THE EXPERIMENTAL PHILOSOPHY OF ROBERT BOYLE (1626-91)

JUST as we have today discontent with established intellectual conventions and prescribed disciplines in philosophies of radical empiricism, relativistic temporalism, and experimentalism, so we find in the seventeenth century a general rebellion against the scholastic abstractions of dead and empty dogmas. In this movement both the so-called Continental rationalists and the British empiricists participated. Both agreed that the classical rationalism of Plato and Aristotle had suffered abuse.

In his dialogue *The Sceptical Chymist,* the Honorable Robert Boyle of Cork, arguing through the personage of Carneades, the academic skeptic, attempted an experimental criticism of the foundering neo-Platonic and Aristotelian principles of natural science. A century later, another countryman of Boyle was to bring the experimental philosophy to a climax; David Hume attacked the last remnants of the abused doctrine of substantial forms [1] and defended the "academical or skeptical philosophy".[2] Hume tells us: "Boyle was apparently a great partisan of the mechanical philosophy which led him to the discovery of so many secrets of nature and led others to imagine the rest." [3]

The mechanical philosophy was due to a revival of Democritean mechanics, including the sensationalism and mathematicism developed respectively by empiricists and rationalists. When Hume added to the above that "Newton showed the imperfections of this philosophy", he realized that the separation of sensible experiments from mathematical calculation impeded scientific growth. And Boyle was not a mathematician, although he respected mathematics greatly (as did Francis Bacon, Hobbes, and Locke). He never formulated the famous law of gases that goes by his name (and by that of Mariotte later on the continent) in the algebraic way usually given in the school-books. We shall see that it was

[1] *Treatise,* Bk. I, Part IV, ch. III.
[2] *Enquiry,* Section XII.
[3] *History of England,* vol. I, p. 374.

the variety of phenomena rather than their calculable order that impressed him most. His main contribution seems to have been the active institution of the experimental philosophy of which Francis Bacon had merely talked in Utopian fashion.[4]

Boyle himself tells us that he never studied Bacon's works until he was thirty,[5] but considered himself the successor of Verulam in the establishment of "a real, useful, and experimental physiology".[6] However, in reading the seventeenth-century controversies about method,[7] we must constantly distinguish the actual scientific practice of the disputants from the speculative issues they defended in behalf of extra-scientific interests.

Boyle expresses repeatedly his aversion to the "unreal, vain and occult forms" of the Peripatetics, Hermetics, and Spagyrists around him. The Hermetics were mystic alchemists who went back to Hermes Trismegistus of ancient Egypt for their knowledge of nature and medicine. Boyle himself tried to improve on Van Helmont's methods of transmuting mercury into gold.[8] We know that Francis Bacon and Newton were not exempt from the same experimental ideas about such magic. The PROCEEDINGS of the Royal Society founded by Boyle and his friends abound with papers on the medicinal power of gems and the astrological influences of the planets as physical problems worthy of the new experimental methods of inquiry.

But the anti-scholastic experimentalists were not all agreed about their new principles. Paracelsus in the sixteenth century had attacked the four elements used by the uncritical Peripatetics and defended a more neo-Platonic doctrine of substantial forms or pure *Iliastri*. He founded the Spagyrist theory that the three fundamental chemical elements were Salt, Sulphur, and Mercury.

[4] C. O. Thompson, *A Study in Biography (Robert Boyle)*, Boston, 1882, pp. 3–4. T. Case, Preface to *Bacon's Advancement of Learning and The New Atlantis*, Oxford, 1913. Also *The Spectator*, no. 554.

[5] *Works of Robert Boyle*, 6 volumes edited by Thomas Birch, London, 1772, referred to hereafter as *B.* The first volume contains Boyle's *Autobiography: The Life of Philaretus*. His abstention from reading Bacon or Descartes is given in *B.*, Vol. I, p. 302.

[6] *B.*, Vol. IV, p. 59.

[7] Windelband, *Hist. of Philo.* (Tufts' transl.), p. 378.

[8] J. C. Gregory, "From Magic to Science", BRITISH JOURNAL OF PHILOSOPHICAL STUDIES, pp. 390–391, July, 1930.

In 1661 Boyle published his polemical dialogue against this doctrine.[9]

Thrown in with such polemics were long essays condemning the whole scholastic metaphysics of substantial forms. But all the evidence of Boyle's own writings indicates that he had no true appreciation of scholasticism; first, because he had not read their Latin writings; and, secondly, because he identified their views with those held by the shallow self-styled Aristotelians around him. Let us present the evidence.

In the first place, he expressly declares that he had forgotten even while young most of his early Latin instruction.[10] And only those unfamiliar with the actual works of Bonaventura, Aquinas, Roger Bacon, etc., would accuse the scholastics of having given *no* thought to sense-experience.[11] Buckle marks "this disregard of ancient authority" as characteristic of Boyle as his experimental method.[12] What Boyle did not realize concerning the scholastic theory of sensible Nature is what many modernists and introducers of novelty into philosophy today do not realize, namely, that the view of Nature of the ancients was not the same as that of the moderns. There were prior to the seventeenth century no discoveries of Gilbert concerning magnets, dissections of Harvey concerning the circulatory system, constructions of Descartes concerning geometrical loci, experiments of Leonardo da Vinci and Galileo concerning mechanical contrivances and motions. Yet it is these Renaissance developments that are held up against those who lived in another world filled with problems of human suffering and unsettled polities which required religious rather than scientific organization.

Our second claim was that Boyle never rejected the genuine Platonic-Aristotelian logic but attacked a perverted form of it

[9] *The Sceptical Chymist: or Chemico-physical doubts and Paradoxes touching the Experiments, whereby vulgar Spagyrists are wont to endeavour to evince Salt, Sulphur, and Mercury, to be the true Principles of Things* (published in Everyman's Library).

[10] *Autobiography, B.*, Vol. I, p. xviii.

[11] B. Landry, *Notion d'Analogie chez Bonaventura et chez Aquinas*, Louvain, 1922, p. 67; *Duns Scotus*, Paris, 1921.

R. McKeon, *Aquinas' Theory of Knowledge*, Speculum, 1929.

É. Gilson, *Études de Philosophie Médiévale*, Strasbourg, 1921.

[12] T. Buckle, *Civilization in England*, Oxford, 1919, p. 300.

current among pseudo-scientists, alchemists, iatro-chemists and theologians of his times. Leibniz was better grounded in the scholastic doctrine of substantial forms, and was able to sympathize with the experimental tendency against substituting formal causes for particular agencies, without dropping formal and final causes altogether from the metaphysics of nature.[13] In Boyle, on the other hand, we have the practical fear of speculative decisions concerning first principles which led his experimental philosophy in the direction of the modern empirical and pragmatic tendency to restrict philosophy to scientific methods exclusively. His limitation of reason to matters of probability in the region below things of faith is dangerously close to agnosticism, notwithstanding the fact that half of his essays are directed to the "Reconcileableness of Reason and Religion".[14] Surely the making of philosophy a purely experimental affair would compel him to reconcile such use of his reason to interests so close to his pious heart as his love of the Scriptures and their spread among uncivilized races. He headed a society for the propagation of the Gospel in New England,[15] and at the same time was asked to become president of a technological school in Pennsylvania.[16] Absorbed in such mundane interests, he could not very well obtain any knowledge of the scholastic solutions to the logic and philosophy of science other than those current in popular form around him.

In what did Boyle's misconception of substantial forms—a misconception shared by most of the attackers of the scholastic logic—consist? The misconception was not his but that of the alchemists and magicians who located essences in things enjoyable by a sense-perception easily fascinated by the bright colors, strange odors, and lurid sights of the chemists' laboratories or by the faith-cures promised by magical healers. Even the later British sensa-

[13] Leibniz, *Discourse on Metaphysics*, Articles X and XI.

[14] *B.*, Vol. IV, Essays v, i, xx. *Cf.* also Vol. I, Essay iv on *Seraphic Love;* Vol. V, essays iv *Of the High Veneration Man's Intellect Owes to God* and x on *The Christian Virtuoso.* Other titles of lost writings are in *B.*, Vol. I, p. ccxxxvi.

[15] *B.*, Vol. I, p. lxviii.

[16] *B.*, Vol. VI, pp. 652 and 658. Boyle declined holy orders in 1660, the year of his first experiments on air, in order, says his biographer Birch, "to pursue his philosophical studies in such a manner as might be most effectual for the pursuit of religion", *B.*, Vol. I, p. ix.

tionalist Mill realized this curious use or abuse of the classical theory of essences: "The word essence . . . scarcely underwent a more complete transformation when from being the abstract form of the verb 'to be', it came to denote something sufficiently concrete to be inclosed in a glass bottle."[17] So Boyle in all his experimental proofs against the Aristotelians rejects their metaphysical forms because he honestly could not find them in his alembics or vacuum-pump.

The correct view of Aristotle's doctrine depends on a distinction of matter and form and a theory of substance that was metaphysical rather than physical. Even Paracelsus kept his principles of explanation, the *Iliastri*, distinct from their sensuous expressions: Fire as a physical principle does not burn, he teaches, for burning is made intelligible by Fire.[18] But the teachers of Paracelsus and many unworthy followers advocated a mystic, cabalistic neo-Platonism which Paracelsus accepted only to the extent that it was "a revolt against the dry and lifeless Aristotelianism of the day, and because it opened the path to the recognition of the value of experiment and observation".[19]

The language of the genuine neo-Platonists, like that of Plotinus, in order to be adequate to their great visions had to be exalted and replete with elaborate metaphors symbolizing what they intuited as the vital principles of nature. When others in the sixteenth century had lost the vision and continued to speak the language of the neo-Platonists, Boyle had sincere reasons for objecting. He wrote very few of his scientific essays in Latin (which he never mastered anyway) and continued to dwell upon the necessity of plain language throughout most of his essays. Many of his arguments against the Aristotelians who vainly tried to imitate the colorful scientific demonstrations of the Arabs consist of condemnations of their "obscure style" and "mystifying verbalism".

[17] J. S. Mill, quoted in Webster's *Dictionary*, p. 750, along with Shakspere's line, "Her honor is an essence that's not seen".

[18] A. E. Waite, *Hermetic and Alchemical Writings of Paracelsus*, London, 1894, Vol. I, pp. 201 f. Pico della Mirandola of the Florentine Academy was one of Paracelsus' teachers, and was responsible for the revival of the Cabbalistic writings. The allegories used by these writers were not to Boyle's taste nor agreeable to his own style.

[19] J. M. Stillman, *Paracelsus*, Open Court, 1920, pp. 28 ff.

Besides, there always existed an acute missionary consciousness in Boyle to use plain language in conveying useful and solid knowledge to the people. Yet his own style is very pictorial and abounds in sense-images faithful to the novel phenomena he was observing in his physical and chemical experiments. The upshot of this philological criticism is that concreteness and vividness of language and style served him very well in his experimental descriptions but did not help him to realize precisely what principles were operative in control of his imagination and sense-experience.

What was Boyle's conception of nature if he could dispense with the Aristotelian first principles and elements? In one place [20] he tells us that he objects only to the *Physics* and not to the *Metaphysics* (which argued for no particular physical doctrines), "or rather to the speculative part of them,[21] for his historical writings on animals I much esteem".

Beside the theological animadversions of Boyle on the Aristotelianism around him, there were certain logical objections he had to their methods of inquiry. They evaded all solid arguments by shifting their categories instead of resorting to observation. For instance, whenever a phenomenon cannot be explained in "actu" they shift to "potentia". Yet we find Boyle implicitly using the category of possibility in his mechanical philosophy to account for the diversity of bodies made up of all possible combinations of moving, *invisible* and variously shaped corpuscles. Obviously, if we reject all those concepts which are not or cannot be exemplified in figured or moving sense-objects, we must consistently abandon essences or immaterial substantial forms. Having abandoned these, let us proceed to what Boyle said he was positively after.

> We evidently want that upon which a theory to be solid and useful must be built; I mean an experimental history of them. And this we so want, that except perhaps what mathematicians have done concerning sounds, and Bacon on heat, there is no quality's history recorded.[22]

Three typical characteristics are to be noted in this quotation. First, the pragmatic conception of scientific theory; secondly, the

[20] *B.*, Vol. III, pp. 9 f., *Origin of Forms and Qualities.* Boyle adds that in this attitude to Aristotle he is agreeing with Verulam, Descartes, Gassendi, and Helmont.

[21] *I.e.*, Aristotle's *Physics.*

[22] *B.*, Vol. III, p. 12.

reference to the work of mathematicians which we claimed above was common to both empirical and rationalistic philosophers of the seventeenth century; and finally, the concern for the "history" of qualities. This word recurs often in the long titles of Boyle's essays, *e.g.* "The Natural History of Air", "The History of Cold", etc., in which fields he made many important as well as many trivial observations.[23]

The etymology of the word *nature* throws some light on Boyle's peculiar "historical" conception of nature. *Nature* is the Latin corruption of the Greek verb for generating or becoming. In the seventeenth century men like Boyle and Newton were known as 'natural philosophers' and also as 'physiologers' (after the Greek for growth, φύσις, the word 'physick' being reserved for the science of medicine). The scientific study of nature was not yet separated from philosophy nor differentiated as much as it is today. The Renaissance ideal of the 'homo universalis' still prevailed, at least in England during the seventeenth century. Yet Boyle and the organization of the Royal Society for "historical experiments" in all directions were responsible for much of the specialized research we have today in physics, chemistry, medicine, mineralogy, etc. Science came to mean institutionalized research rather than knowledge of nature as a whole. Boyle followed Descartes and Galileo in attempting scientific inquiry independently of church organization and orientation.

He also adopted their quantitative mechanistic physics as opposed to the qualitative teleological physics of Aristotle, which formed a strong pillar of Thomas Aquinas' world-view.[24] When we inquire into the reasons why nature was no longer conceived as a living whole moved by the spirit of God but as a self-moving engine or automaton,[25] we find mainly practical, methodological issues involved. The impressive achievements in mechanics of Archimedes, Hero, Jordanus Nemorarius, Leonardo da Vinci, Galileo, and many others, in a world that was in need of such devices to carry on its explorations, colonization, and world-build-

[23] G. Moennichs, *Robert Boyle als Geophysiker*, München, 1899, gives Boyle credit for being the first to consider the air as a nonhomogeneous body. *Cf.* p. 57, "Luft und Atmosphäre".

[24] P. Duhem, *Évolution des théories physiques*, Paris, 1902.

[25] *B.*, Vol. III, p. 34.

ing, led Boyle and his co-workers in the "House of Salomon" enterprise of the Royal Society to conceive nature in terms of mechanical operations.

By "Mechanicks", whose axioms Boyle is going to accept as the foundation of all the sciences, he understands "those disciplines that consist of the applications of pure mathematicks to produce or modify motion in inferior bodies".[26] The use made of mathematics here is instrumental rather than metaphysical, although we are told that "the phenomena which the mathematician concurs to exhibit do really belong to the naturalist".[27] Within the physical realm there is complete objectivity of qualities, both primary and secondary; and in this sense Boyle is, like Locke, a realist. But the epistemological problem is not in the foreground so much as the problem of constructing a sort of draughtsman's plan of nature with which to make discoveries and inventions. So far as the logical framework of such a plan of nature is involved, Boyle himself outlines the grand assumptions or solid foundations on which he is willing to build. These are stated as the "twelve principles of variation in bodies".[28]

I. Local motion having various determinations divides matter into finite parts.
II. These finite parts necessarily have some definite size or magnitude.
III. These finite parts have also a determinate shape or figure.
IV. Some of these parts *being arrested by their mutual implication* are in a state of rest and all the others are in motion, there being no middle state.

"And these are the most primary and simple affections of matter."

Before going further it is well to note that the finite fragments of matter produced by local motion are composed of lesser insensible particles called "corpuscles" whose combinations produce the properties given above. Hence the ideal nature of these corpuscular elements—Boyle always insists on his corpuscular theory as a mechanical *hypothesis*—justifies Lasswitz in denying that Boyle was a materialist.[29] It is too often assumed that experimentalism is necessarily attached to some particular philosophy, whether pragmatic or materialistic or realistic. Yet Boyle, Des-

[26] *B.*, Vol. III, p. 345.

[27] *Ibid.*; the influence of Descartes is obvious here.

[28] *B.*, Vol. III, p. 297, *The History of Particular Qualities*, ch. iii.

[29] *Gesch. der Atomistik*, Vol. 2, bk. 3: "Der philosophische Aufbau der Korpuskulartheorie".

cartes, and even Spinoza, realized the need of experimentation without agreeing even in their physical conceptions. A philosophy is an interpretation of experience and not merely experience even of the controlled institutionalized form in which Boyle cultivated it. But let us proceed with the strictly logical part of his scheme.

V. All corpuscles have a particular position relative to other bodies.
VI. All corpuscles have a certain order or consecution relative to a perceiver.
VII. The manner by which these corpuscles exist together in an individual body is their texture or modification.
VIII. Because of the irregularity or difference in the figures of the corpuscles, there will be pores in almost all solid bodies and gross fluids.
IX. The minute corpuscles that constitute bodies are constantly streaming off them in an invisible manner.
X. Concretions of corpuscles are of three sorts:
(*a*) Primary elements or concretions of homogeneous corpuscles.
(*b*) Compounded bodies or conventions of definite proportions of elements.
(*c*) Decompounded bodies or mixtures of compounds.
XI. All portions of matter (corpuscles, primary elements, compounds, or mixts) are not only related to neighboring bodies but also governed by "the universal fabrick of things, as by the laws of motion established by the author of nature in the world".
XII. Matter exists incorruptibly.

The main features here are, from the logical standpoint, the *relativity of position and order to particular bodies as standpoints* [30] —a principle which Leibniz regarded as fundamental from a purely rationalistic point of view; *the principle of individuality* as a surface texture or modification to be compared with Spinoza's modifications which are individuals only by abstraction; *the hypothetical nature* of such physical realities as corpuscles and vacua; *the pyramidal construction* of bodies from elements of an indefinite number of kinds which hardly differ from Democritus' elements; the distinction of compound and mixture; the universality of mathematical law; and, finally, the conservation of matter. Curiously enough, none of these features is merely an experimentally established one. In the last case, for example, science had to wait for Lavoisier's measurements before it was convinced of a principle it had been assuming in a theological context.

Further, the experimental argument in favor of the corpuscularian hypothesis rests mainly on an ancient analogy.[31] All the

[30] *B.*, Vol. III, pp. 18–37, *An Excursion About the Relative Nature of Forms and Qualities.*

[31] H. Wildon Carr, *The Principle of Relativity*, p. 48.

words of the various languages of the world are producible by combinations and permutations of a limited number of signs of the alphabet. So by "connecting such and such shapes, sizes, and motions into masses or concretions, an innumerable multitude of different bodies may be formed".[32] Now Boyle very explicitly claims no *proof* of the corpuscular theory; he wishes only to illustrate and use the notion by means of "sensible experiments, and manifesting that the things treated by me may be at least plausibly explicated without having recourse to inexplicable forms, real qualities, the four peripatetic elements etc".[33]

Local motion, size, shape, and texture are more than experimental facts for Boyle because they are independent properties of the external divine arrangement of things. Like the Galilean primary properties, they are the keys to the locked mysteries of nature whose inner mechanism is not sensible.[34] The possibilities of nature are then limited to the permutations and combinations of a few universal characters: bulk, configuration, motion. If we were to ask, Why *prefer* these among all the other characters of things? Boyle's answer would have to be in terms of the tradition of 'solidity',[35] the Cartesian geometry of extension, and the empirical pragmatic satisfactions of mechanics.[36]

Captivated by the simplicity, plausibility, and applicability of the Democritean hypothesis, Boyle was able to describe and carry on an enormous variety of experiments in his physico-chemical laboratory. He was very fortunate in having the expert mechanic, Robert Hooke, as assistant. They introduced all sorts of objects, physical and biological, into the rarified atmosphere of the vacuum-pump called the *machina Boyleana*. The corpuscular analogy was used again and again in Boyle's reports as a unifying

[32] *B.*, Vol. III, p. 298.

[33] *B.*, Vol. I., p. 356

[34] *B.*, Vol. III, p. 24.

[35] *B.*, Vol. I, p. 22: "Bulk is an absolute thing".

[36] *B.*, Vol. II, pp. 1–103, *Usefulness of Experimental Natural Philosophy.* Pt. I deals with anti-deistic arguments; Pt. II with the value of experiments in "physick". Also in *The General History of the Air*, we are assured that a knowledge of the air through experiment will be of great use to medicine, navigation, agriculture, etc. *Of the Excellency and Grounds of Mechanical Hypothesis* (*B.*, Vol. IV, pp. 68–78) is appended to an essay on the *Excellency of the Study of Theology.*

type of explanation for all the natural phenomena he observed, chemical and physiological as well as mechanical and geological. For to say that the corpuscular theory applies only to physical phenomena would be like saying that the alphabet may suffice for the composition of Euclid or Vergil but not for all the great books of the world's library. It would be spatially impossible to summarize even the profuse illustrations and experimental observations Boyle adduces to show the *applications* of the mechanical hypothesis. The cases he elaborates most are those which were wont to be explained in terms of occult qualities and other forms of supernatural science described above as perversions of neo-Platonism. The magical curing powers of gems—which Boyle never doubted as a fact—were explained by him as natural chemical changes produced by the effluvia of minute corpuscles contained within the gems. Those who cured by contact of their hands with the affected parts of diseased bodies were making use of invisible streams of corpuscles. The latter (*cf.* Postulate IX *supra*) were also used to account for astrological influences. Few of the chemists in Boyle's day cared for the speculations of the philosophers on the rival mechanical theories of the atomists, vorticists and Aristotelians (of whom the only true representatives were the Arab chemists according to Holmyard). Boyle had an aristocratic disdain for the "sooty empiricks" who kept chemistry from developing on a scientific, experimental basis by employing undefined, metaphorical terms. The desire to make chemistry a useful branch of 'natural philosophy' expressed itself successfully in his experimentalism, because he realized the importance of clear and distinct concepts. Before one could utilize the book of nature one had to learn to read its plain sensible language. The clearest formulations of nature that existed in the seventeenth century were, with the single outstanding exception of Leibniz' monadology, mechanistic. Nature meant to those who were most impressed with the mechanical inventions of the Renaissance scientists a gigantic machine whose parts and motions obeyed the simple, eternal but self-evident principles of mathematics. To read the book of nature with the aid of Democritus became equivalent to the medieval problem of reading the Bible with the aid

of Aristotle. The luminiferous and the fructiferous experiments of Francis Bacon were to replace revelation and salvation.

The pervasiveness of the machine metaphor is evident from Boyle's description of the human body as an "hydraulo-pneumatical engine". A fever or sickness was due to the disturbance of the proportions of the fluid parts and their mathematical motions. Boyle refused to take his corpuscular and mechanical philosophy in a metaphysical sense, that is, as anything more than the most simple and fruitful hypothesis known to him. He could criticize both Descartes and the atomists without committing himself to a final position on the nature of the ultimate constituents of matter.[87] For theological reasons mainly, he cannot agree with the Epicureans who ascribe natural phenomena to chance, or with those who conceive nature as capable of forming a system merely by the laws of motion and matter without the transcendent first cause. He sees no reason for rejecting the soul from the human body or from animals, nor for accepting as certain either the Cartesian arguments against the atoms or the atomistic arguments against the plenum. The mechanical philosophy suits him best because he can describe his experiments best and most plainly by means of it. Hence his main arguments for adopting the mechanical hypothesis are based both on pragmatic and on such abstract logical considerations as the following:

I. The twelve principles of the mechanical doctrine (*supra*) have a clearness and intelligibility not possessed by the "dark and intricate" explications of the Aristotelians and Paracelsians.

II. The grand principles of the mechanical philosophy are no more than two in number, Matter and Motion.

III. Matter and motion are physically irreducible despite the various metaphysical interpretations which make nature the direct creation of God, or a product of intermediary agencies, or finally an emanation from the Godhead.

[87] *B.*, Vol. III, Pt. VI: "The inner mechanism of bodies is not visible" (p. 23). In "A Discourse of Things Above Reason" the same natural light of reason of which Descartes and the medievalists made metaphysical use is restricted by Boyle "to the sphere of activity within which nature has bounded it". "Thus we usefully study the nature of bodies, which make up the object of the excellent science of natural philosophy; though the true notion of body in general be a thing so difficult to frame that the best of our modern philosophers can by no means agree about it." Yet he adds that it is important to study transcendent ideas if only to know piously that they are too dazzling to be clearly perceived by our light.

IV. No other principles are intrinsically simpler or more self-evident than matter and motion.

V. Mechanism in nature suffices to comprehend all its physical properties in terms of figure, size and local motion.

The logical criteria of simplicity, irreducibility of primitive notions, self-evidence, and sufficiency, which mark these grounds of the mechanical experimental philosophy of Robert Boyle, are formal and not experimental features. They have much in common with the method of the Continental rationalists, *more geometrico*. It is only in the subordination of the systematic to the utilitarian that the 'empiricists' of the seventeenth century differed from the 'rationalists'. But this difference is one of interests or values rather than one of method of reasoning.

The divorce of experimental findings from system led Boyle to an inconsistent or ambiguous theory of simplicity. Whereas we have seen him postulate corpuscles and certain primary properties as ultimately simple, we find him describing certain *qualities not included among them* as also simple since they are directly observable.[38]

There are some qualities or accidents, that least in comparison with others may be called simple, as roundness, straightness, heat, gravity &c, so there are others that may be conceived as compounded or made up of several qualities united in one subject: as in divers pigments, greenness is made up of blue and yellow exquisitely mixed; beauty is made up of fit colors, taking features, just stature, fine shape, graceful motions, and some other accidents of the human body and parts.

Boyle was vaguely aware of this difficulty of assuming both sensible qualities and insensible corpuscular properties as primary and then deriving the former from the latter; for he claimed only probability for the existence of the corpuscles, and, secondly, modified the five reasons just stated for adopting the mechanical hypothesis by adding:[39] "Neither matter nor qualities apart, but both of them conjointly, do perform what we see done by bodies upon one another, according to the doctrine of qualities we have just delivered." This was an honest avowal that matter and its primary properties of extension and motion were a metaphysically insufficient rendering of the sensible world. The door

[38] *B.*, Vol. V, p. 220.

[39] *B.*, Vol. III, p. 25.

was left wide open for the entrance of Berkeley's criticism of matter and of the separation of primary and secondary qualities. There are still scientific philosophers today who are anchored to the metaphysic of hypostatized properties of atoms and cover the discrepancy between their experimental results and their plainer experience by the introduction of "emergent qualities". Boyle used the phrase not as an explanation of any particular phenomenon but as a description of new sensible effects produced by his chemical experiments. He used many other descriptive images in discussing the elasticity of the air as due to the springlike properties of the coiled corpuscles resembling the flexible hairs of a fleece of wool, or the curly shavings of wood, or the threads of a silkworm, or the dry spunge.[40]

The rôle of such hypothetical imagery in Boyle's experimental method—found also in the mechanical models of later physicists like Faraday—was not[41] "to assign the adequate cause of the spring of the air". That the invisible corpuscles which he was willing to assume as probable causes of the spring of the air were as much products of analysis as were the substantial forms of the Aristotelians seems never to have been noticed by him.

The value of dialectical controversy in science appears from Boyle's arguments against (1) the funicular hypothesis of the Aristotelian and Jesuit, Linus; (2) the materialistic doctrine of Thomas Hobbes, who openly mocked the experimental program of the Royal Society and its religious enthusiasm; (3) the spiritualistic theory of space and extension of Henry More, the Cambridge Platonist.

With respect to the Jesuit, Boyle wishes to assure the public that the mechanical theory can be defended without impugning religion. For none of his experiments was intended to support any metaphysical theory of the air and the apparent vacuum which he was able to produce by means of his exhaust-pump. It is only upon experiments and observations that he wishes "to ground hypotheses and theories".[42] He then points out that neither

[40] *B.*, Vol. I., p. 11.

[41] *Ibid.*, p. 12.

[42] *B.*, Vol. I, p. 178: "So that for me to leave experimental for controversial studies was a course unsuitable".

Linus' nor Hobbes' nor More's objections to his corpuscular explanation of the vacuum touch his experimental findings. They rather urge various metaphysical interpretations of them which he is not inclined to accept. Linus' funicular substitute for the vacuum and the "sucking powers" of an ethereal plenum are not empirically intelligible nor probable. The Aristotelian assumption of the infinite divisibility of a potential continuum (*extensio virtualis*) is attacked by Boyle on the empirical ground (which is not really contrary to Aristotle's own view) that such potentialities are imaginary. Yet his solution of Galileo's paradox of the infinite in the *Rota Aristotelica* in terms of finite parts and empty spaces is quite different from the mathematical analysis of Galileo just because Boyle used purely imaginary instead of analytical concepts. He must have overlooked the fact that Galileo himself placed experiments last in methodological order after Resolution and Demonstration. For Galileo experiments were not "to found hypotheses on" but means or occasions of recognizing and observing the analytical components of phenomena.

Boyle failed to appreciate the metaphysical problems attendant upon writing experimental histories of nature. He was primarily a pioneer laboratory-thinker, although his extensive writings did mirror nearly all the outstanding tendencies in seventeenth-century philosophy. When, for instance, Spinoza suggested that his experiments on nitre could be all grounded on a simpler molecular physics than Boyle had assumed, the Honorable Gentleman saw no need of taking this view of his costly and laborious experiments seriously, because Spinoza was not a laboratory-mind nor technically expert in all the histories of nature. Yet all that Spinoza had said was not that experiments were useless; for he experimented himself in physics and calls experiments valuable aids to the imagination.[43] Spinoza followed the tradition of experimental philosophers like Leonardo da Vinci, who said: "Know the causes and there is no need of experiments."

To the two conditions which Hobbes lays down for a good hypothesis, *viz.* "(1) that it be conceivable; (2) that from its being granted, the necessity of the phenomenon be inferred", Boyle

[43] *De Intellectus Emendatione*, XIV, 103. *Cf.* R. McKeon, *The Unity of Spinoza's Thought*, Part I, Ch. 4, "Spinoza and Experimental Science".

would add a third, "that it be not inconsistent with any other phenomenon or truth of nature". This curious non-experimental and quite formal criterion shows that Boyle himself realized the need of structural connection in his experimental histories. The same honesty led him to talk inconsistently about final causes in his pious discourses on things above reason after he had rejected final causes in his mechanical philosophy of nature. The metaphysical lacuna in his thinking between the diversities and the structural identities of nature resulted from his trying to do justice to the former in his experiments and leaving the latter for his theological speculations.

PHILIP PAUL WIENER

DISCUSSION

REASON AND NATURE

THE appearance of a volume by Professor Morris R. Cohen under the above title is a notable event in contemporary philosophy. Although many of its chapters have been already published in the journals, they are here revised and supplemented. The book as a whole presents the author's systematic statement on the great issues of metaphysics; and its publication is notable not merely because Professor Cohen's position in American thought renders it a matter of course that any such statement would be well pondered by students of philosophy. As one who has kept in touch with the author's briefer writings would expect, his hints on the various detailed topics treated are always illuminating and often provocative. He modestly disclaims originality, but it would be hard to find clear precedent for many of the significant departures in method and result. Perhaps the most distinctive step for an American metaphysical treatise is the discussion—in addition to comments on the implications of scientific method in general—of specific problems of method in each of the main branches of science, with considerable attention to psychology and the social sciences. It would be tempting to allow oneself to follow Professor Cohen into several of the specific themes which these discussions help to clarify and consider the structure and growth of science in the light of his stimulating analysis.

But the volume is notable on another account. After *Experience and Nature, Reason and Nature!* The intended contrast and challenge are obvious, and in view of Professor Dewey's conception of the relation between his philosophy and modern science, the conflict is sharpened by the subtitle—"An Essay on the Meaning of Scientific Method". In these two volumes, in fact, we face two radically diverse interpretations of the nature and significance of science. One leads metaphysically to a naturalistic empiricism, the other to a realistic rationalism.

Since we all pretend to be scientific in our metaphysics today, this is a basic issue. The appearance of Professor Cohen's book is a pertinent occasion for weighing the type of answer to it which he defends. Let us make the question precise. Does the rationalism of scientific method involve the realism which he believes it involves, and, if not, where lies the appropriate alternative?

In a sense it is unfair to the present volume to make it the target of such criticism. It is not Professor Cohen's main purpose to provide a systematic argument for metaphysical realism; his aim is more catholic in scope; many readers who disagree with him on this issue will sympathize with the broader trend of his discussion and will be sure that the latter would gain rather than lose by the surrender of this (to them) unfortunate heritage of pre-relativity philosophizing. None the less, realism in the traditional sense is clearly presupposed throughout the book and in some chapters overtly defended. Professor Cohen therefore makes it necessary to face the issue once again and ask whether his major convictions on this point can stand the test of criticism.

The close connection of realism as Professor Cohen conceives it with the postulates of scientific method gives his position many similarities to the realism of Cournot three-quarters of a century ago, though of course he divests it of the latter's theological setting and states it in the light of the whole story of scientific thinking to date. The substance of his teaching clearly aligns him with men of Cournot's stamp. And the harmony of this doctrine with the natural assumptions of most scientific men is certain to render it for long a powerful factor in modern thought. But the controversial background presupposed in the present treatise clearly shows that in temper the author belongs in the more recent group of realists who two and three decades ago revolted from the fold of neo-Hegelian idealism, on the plea that the logic by which its metaphysics was reared substituted synthesizing aspiration for exact analysis of objective fact. One is confirmed in this conclusion by noting his opinion of pragmatism. Like the other realists of those polemical days he sees in pragmatism nothing but a weird and irrational form of subjective idealism, typified by James' confusing discussions on the nature of truth and justification of religious faiths on the ground that one always has a chance of getting away with them.

Realism in this temper is on the whole declining among students of philosophy today. It is natural that it should decline, since the idealism combatted is on the wane, and since Professor Dewey is gradually convincing the younger generation that pragmatism as he conceives it is an affair of somewhat different controlling motives and assumptions than the pragmatism of James, and cannot be disposed of under the convenient rubrics by whose aid the latter, since his death, has been conventionally refuted. But of course Professor Cohen's realism is much more than a continued nourishing of this unhappy temper.

It is a challenging view of the universe which all of us face. Metaphysically it is moderate, going to no such absurd extremes as in the first flush of its success modern realism was apt to embrace both in England and in America. Yet its epistemology is true to type, admitting validity to none of the fundamental idealistic or pragmatic arguments, and the attempt is made to justify its claim to a secure foundation in the method of science by a more thorough canvassing of scientific procedure than has yet been offered to such an end.

What is the essence of this position? It is that rational order or structure is one real phase of the objective world, and a sufficiently fundamental phase to be appropriately called the very substance of nature. By this is meant, as in the case of most rationalistic realists, that the structural connections of the facts of experience give the latter their essential character. To be sure, Professor Cohen is sufficiently removed from the days of fanatical rationalism to admit an ultimate element of contingency in nature also, so that reason must not be supposed to exhaust her. Yet it supplies her objective essence, which mental activity in us, if fortunate, may come to disclose. As against all forms of epistemological idealism, he is firm in refusal to see in this rational order dependence on any factor to be located in human or superhuman knowers of nature. It is independent, structural, substantial.[1] And in Professor Cohen's portrayal this metaphysical faith becomes very enticing and plausible. Do the implications of scientific method in fact lead us to realism so conceived? It may be worth while first to clear a little ground.

I suppose that if one were to say simply that thinking assumes intelligible order in the object of thought, and that it is highly desirable to discover as much order as possible in our world and to orient all our activities as rationally as we may, he would be saying something acceptable to all philosophic parties with the possible exception of extreme mystics or radical irrationalists. Up to this point, therefore, there is no live contemporary issue.[2] Further, coming to closer quarters with the metaphysical interpretation of this order, it is important to decide just what we are going to mean by mind if we intend to maintain that reason exists in nature independent of mental activity. This has not always been done, to the very serious confusion of our epistemological debates.

Let us, for example, define mind explicitly in the fashion that ap-

[1] *Reason and Nature*, pp. 161, 142, 143, 135 f., 151 f., 200.

[2] We may call this almost universal position *methodological* rationalism, to distinguish it from metaphysical rationalism. See also p. 13.

pears to be presupposed by many realists in their epistemological moments (though rarely openly defended against contrary doctrines), namely that it is bare awareness of whatever is present. By this definition everything in the way of content or process will be excluded from mind—not only objects and images but even desire, feeling, and purpose will lie outside it. They will all be part of its world rather than part of itself. Now on this basis the most subjective of idealists and humanistic of pragmatists would be constrained to admit that mind makes no difference to its object. He would feel uncomfortable with such a notion of mind to philosophize with, but he would certainly be able to find nothing dependent on it, for the simple reason that he never compares anything of which he is aware with the same thing when unaware of it. Indeed, if mind be impoverished to this extent, many realists have been as unable as the older objective idealists to discover that any such entity exists at all as distinct from its object. If then realism means simply the affirmation of events and things of which we may be aware without our awareness changing them, again so far as I can see there is no issue—we are all realists. And since nature so understood includes everything except awareness it will include the relations and order of events as well as the events ordered, so that we may affirm a real independent intelligible pattern of nature in this sense without setting philosophers on opposite sides of a fence.

Confusion begins to threaten our philosophic foundations when realists who in their epistemological discussions assume the above doctrine of mind fail to stick to it when they pass to related problems and talk blithely as though mind included all the affective, volitional, and constructive processes that common sense and introspective psychology have always assigned it. It will not do thus to play fast and loose with our terms.

We need not multiply these latter reflections in examining Professor Cohen's position, however, for while he nowhere gives a formal definition of mind and the reader easily suspects that his foundations would be more critically considered if this gap had been filled, he makes it clear that he does not share the above doctrine. Mind for him, while centrally consciousness or awareness, includes intellectual activity of some sort as well as affective and volitional quality. Our crucial question then in his case is clear: In the light of scientific method, should we regard the rational order in the world as independent or dependent on factors to be located in mind in this broader sense?

Pondering this question one is soon forced to wonder whether realists, in their zeal to ban all wishful thinking and pontifical claims

to creative power such as immodest idealists are supposed to revel in, have not become a bit unrealistic themselves and turned their backs on unpleasant facts which do not fit into their visions of reason pervading the world. Indeed, he may be led to urge that idealists and pragmatists have critically raised certain questions that realists of the orthodox schools have not raised in the same systematic way and on which accordingly they tend to make assumptions far too simple to be adequate to the circumstances which must be accounted for. To be sure, these questions are most difficult to answer confidently, and I should be loath to defend the extreme answers offered by representatives of either of these schools.

But the facts are there, and if we open certain problems in a thorough-going way it is difficult to avoid seeing them. This brings us to the heart of the issue. Let us consider first the bearing on it of a broad principle acknowledged in some form by almost all philosophers, and then work our way toward the critical facts that support this principle in general and a theory inconsistent with Professor Cohen's realism in particular. Suppose we forget such debating concepts as experience, the egocentric predicament, external as against internal relations, etc., and ask simply what we can intelligibly mean by affirming a certain character, say, order, of the world of nature. Can we mean that nature in herself, apart from all relations or conditions, has order? It is of course inadequate to point out as the idealist has done that some relation is always in fact present when such an affirmation is made, or with the pragmatist that there is no way of verifying it if all relations (including the relation to a verifier) are ruled out. The realist may rejoin that the assertion still has definite and objective meaning, namely that if all thinking were eliminated from the scene nature would still have the order that thinking discovers in her. But it is important to realize that the question strikes deeper; it involves the problem *how any determination can be intelligibly made without specifying the limitations or conditions under which the determination holds.* (One excepts, of course, neutral concepts of totality, like *universe, nature,* and the like.) Without such specification, as Professor Cohen himself maintains in his Principle of Polarity, and as he urges with great force against monistic idealisms and materialisms, the determination loses its distinctive meaning and evaporates into vacuity—saying that all is mind and that all is matter become equally insignificant, being and non-being fall into each other's arms. Science, as he insists, has also been forced to learn this lesson; when it discovers some character in the world it makes no absolute pronouncements after the

fashion of ontologies in the past; its task is to determine precisely under what conditions this character is revealed and under what conditions not. May we not apply the same principle to metaphysical categories such as reason, structure, and the like?

Let us draw an exact analogy from recent scientific discussions. It means something to say that a given body moves with a certain velocity under the condition of a stipulated point of reference. To say that it moves without specifying any condition is seen now by all to be entirely meaningless, for thus motion and rest become indistinguishable. It means something to say that a straight stick is crooked under the condition of being partly immersed in water and viewed by the normal eye. It means nothing of course to say without qualification that a straight stick is crooked. By exactly the same logic it means something to say that under the conditions supplied by the observation and memory of a given human being with all the relevant factors which are functioning in him the world is ordered. But to say that it is ordered entirely apart from any conditions is to cling in metaphysics to an absolutism which in analogous cases science as well as common sense has been forced to abandon as hopeless. It is for the confirmed realist to show if he can how order and disorder are distinguishable if either is supposed to characterize the world apart from all conditions. As a matter of fact Professor Cohen is too conservative a rationalist (as already pointed out) to believe this; contingency he holds to be in nature as well as reason. And if so, then neither contingency nor reason is absolute. But he still maintains that reason rather than contingency is nature's substance, and nowhere essays the task of pointing out under what conditions the one characterizes her, under what conditions the other.[3] This is the question a man trained in science would raise. It is also a question idealists and pragmatists have systematically raised, and the grandiose absurdity of some of their answers will not furnish sufficient excuse for metaphysicians failing to face the question and push it through to a better answer.

Once we have seriously entertained the supposition that all determination is specification of conditions and that metaphysical conditions may be appropriately sought wherever one sees a chance of finding them, another question becomes pressing which pragmatists at least have tried to answer fairly, however much they have been led to untenable extremes in the doctrines reached. Let us forget all about such issues as whether mind in any sense creates its object, and ask

[3] He does note a few specific ways in which contingency reveals itself in nature (pp. 151 f.).

simply what factors involving the presence of human beings seem to help explain why the world reveals the metaphysical characters we attribute to it. This is a quite objective and empirical question. Why, to take our present issue for example, do we regard the cosmos as possessing rational order? One fails to understand the setting of the question if he merely replies, Because the cosmos really is ordered and we are able to think truly about it. This would be equivalent to answering the question, Why does the observer on the south pole see the sun moving in a circle equidistant from the horizon?, by saying, Because the sun really does move in such a circle and he is able to see it correctly. We regard such an answer as grotesque, and why? For this reason. The facts show that under other conditions the sun is observed to behave differently, and we do not think any answer very satisfactory unless it takes account of this circumstance and indicates why the sun appears differently elsewhere as well as that it must appear thus to the eye on the south pole. An explanation must explain *all* the relevant attested facts.

Some pragmatists, I take it, have been trying to offer precisely the same kind of explanation in metaphysical problems, such as that of the rational structure in nature. Not much tenable headway has yet been made, of course, but if similar answers may be properly sought in common sense and science, why may they not be properly sought here? For the same kind of circumstance which there compels them is at hand here and in plentiful quantity. We come then to the hard facts which stand squarely in the way of Professor Cohen's theory.[4] People, ages, races, and groups have differed in the kind and degree of rationality which they have found in their world. Many find much more chaos and uncertainty than the opposite, and it may be surmised that were we not so strongly gripped by our scientific enthusiasm we should agree with them; certainly none are without some experience in which the sense of unpredictability in the cosmos becomes overwhelming. Is it scientific to propose an answer to the problem of the rational structure in nature that ignores these circumstances? Would such an answer have any more logical virtue than an answer to the problem of the motion of the sun which ignores the fact that there are different points of view from which the motion of the sun appears differently? And surely such variations depend on the observer as well as on something outside him. Indeed, if we conceive mind as broadly as Professor Cohen does, may we not say definitely that at least some of them

[4] Not to attempt to anticipate lessons of contemporary physics which may support the same conclusion from an entirely different angle.

depend on the observer's mind? Our author himself admits that people see facts differently according to the different wishes and expectations which guide the seeing. Now wishes and expectations are mental affairs. Do not the above considerations strongly indicate that metaphysical facts are in the same case as the rest, and that therefore some of the variable conditions affecting the rational order of the world are to be located in mind?

I am quite aware, of course, of the way in which realists are wont to brush aside these factual considerations as unworthy of serious attention. These people, they say, who fail to see much rational order pervading their world are lost in ignorance and superstition; they represent the intellectual infancy of the race; are we to accept their testimony in preference to that of such wise and cultured postulators of reason as our sophisticated selves? But the question is not one of choice or preference, it is whether we are going to account for all these circumstances or only an arbitrarily selected portion of them. These ignorant and superstitious people (if we insist on branding them as such) are a part of nature. Their opinions about nature are also a part of nature. By no hook or crook can they or their opinions be conjured out of existence. Even if they should all of a sudden be converted to scientific ways of thinking it would still remain true that their former opinions had really existed; it would still hold that under the conditions supplied by their ignorance and superstition nature presented herself more as disorder than as order. They offered a real metaphysical perspective of the world. Nothing significant, surely, is proved by our dislike for what they find and our eager wish that they might find something more comforting to our rationalistic predilections.

And is it not rather unscientific anyway to put on such haughty airs about the virtues of the perspective from which we orderly-minded folk happen to view the world? Return a moment to our inhabitant of the south pole. As he sees it the sun moves in a most simple and seemly curve. Late in September it slips above the horizon and, circling evenly day by day, slowly rises a fourth of a quadrant. Then it reverses its course and after six months has disappeared once more. How rational in its neat simplicity! Surely, he must conclude, those folk in other parts who see the sun gyrating in more complicated curves are sunk in childish and unæsthetic delusions. They need conversion to the purity of reason, so that they might see the sun behave in accordance with the requirements of immaculate order. Does not this analogy forcibly reveal how impossible it is to pass by disturbing facts by insinuating immaturity in the minds which find them to be facts?

Just as there were natural and inevitable causes for the sun's appearing differently to other observers than it did to the south-pole tenant, and no explanation of the sun's behavior is adequate that does not account for its appearance to all of them, so there are natural and inevitable causes for the world's appearing chaotic rather than rational to observers whose interests, expectations, emotions, and established ideologies, are radically different from ours, and no explanation of reason in nature is adequate that does not account for its variations to such observers. Moreover, it must account for them impartially. Is it not intellectual irresponsibility as well as moral snobbery to treat those who see nature differently from ourselves as though they did not exist and their point of view might in no wise count for anything?

We must ask the realist to be realistic enough not to ignore relevant facts or push them aside from serious consideration. If he does so neglect them it is hard to explain his conduct on any other ground than that he very much *wants* the world to be rational, thinks it highly important to discover all the order possible in it, is eager to discourage people who wait for lucky chances and pray for providential dispensations—in short, desires to focus the attention of the world on reason rather than on its all too prevalent and popular alternatives. These are most laudable motives. But to do this by saying that reason is the substance of nature is to camouflage propaganda in the guise of metaphysical logic; it is to deny the very tragic facts from which he wishes to rescue troubled humanity, the facts namely that most people find much unreason in their world and delight all too readily in it. And what have we in this staunch refusal to face nature's chaos, this grim insistence that her essence is order, but wishful thinking reminiscent of the hated idealists with their comforting doctrines of a universe ultimately responsive to wise human needs? If we are to go realist and face the music of disappointing truths, let us muster strength to go all the way.

Reason a substantial factor in the world? Yes, assuredly, and so is unreason. Under certain conditions the one will seem to dominate nature, under different conditions the other. It is important to locate these discriminating conditions, for no explanation of reason in nature will do which forgets them. To be sure, such discriminating conditions themselves will not be found unless we postulate that they, like other objects of intelligent inquiry, reveal an orderly pattern, and for this reason pragmatists will doubtless affirm as vigorously as Professor Cohen that it is highly desirable to discover as much order in the world as we possibly can. Clearly the dependable conditions of unreason

must be as rational as the conditions of reason. But it is one thing to postulate rationality in this way as a matter of intelligent method—it is another thing to insist that it exists entirely apart from those conditions which seem to be required for its appearance. Plenty of unreason, too, exists in the world under appropriate conditions, and if we eliminate the conditions how shall we justify ourselves in affirming reason as the substance of nature rather than unreason?

I see only two ways in which the point of this criticism may be avoided and the validity of the conclusion impugned. One is to show that those who see much unreason in nature are liars—that they really see as much rational order as the most fanatical devotee of rationalism, but are indisposed to admit it. The other is to show that although they do actually see considerable chaos rather than universal order, and that under the conditions which have determined their view of the world they cannot possibly see anything else, yet it is intrinsically illegitimate to view the world in that fashion. I fail to glimpse any possible procedure by which either of these propositions may be given plausibility, let alone geniality.

Here is the nub of the matter as far as Professor Cohen's moderate but essentially orthodox realism is concerned. He is not an absolutist; contingency is in the world as well as intelligibility; but yet the latter rather than the former is maintained to be nature's substance, and this without any systematic inquiry into the conditions of either, or any frank facing (in this context) of the facts which point toward a more complex interpretation. As far as the underlying logic is concerned, is not this position essentially analogous to that of an early astronomer whom we may hypothesize, the defender of the doctrine that, although the sun is at times below the horizon as well as above, it is of the essence of the world for it to be above, and since both positions are objectively real there is no need to ask under what conditions it is in one and under what it is in the other?

It is not my purpose, of course, to offer a brief for any idealistic or pragmatic point of view; the realistic reaction against the former has certainly been very salutary, while pragmatism is a confused movement on its metaphysical side, harboring a diversity of motives of which that just stressed is only one. But the great lessons of modern thought are every day more emphatically inconsistent with a realism which blandly attributes characters to the world at large and fails to envisage the need of a more empirical, specific, and exact explanation. Metaphysicians must, if they are to become scientific, recognize that there are circumstances under which any attributed category is absent

and attempt the difficult task of discovering precisely the conditions under which it is present, those under which it is absent, and those under which it is present in varying forms and degrees. Were absolutistic realisms and idealisms no longer in the offing, and pragmatisms of the anti-intellectualist variety, it would be easier for philosophers of all persuasions to join in the program of extending scientific method in metaphysics by formulating hypotheses as to the conditions affecting the range and relevance of metaphysical categories and testing them by the same empirical means that we use in the complex and undeveloped sciences. Metaphysical absolutism is the one ogre standing in the way of this coöperative advance.

At heart, to be sure, Professor Cohen is no absolutist; furthermore, like every vigorous thinker, he is a prophetic leader even of those trends of philosophic endeavor with which he would formally disavow all connection. Breadth of interest and vision, keenness of critical analysis, infinite patience in tracking out the sources of difficulty in contemporary speculation, realism unafraid of many tragic facts that philosophers have often fled—one so deeply pervaded as our author is by these and other philosophic virtues becomes guide and comrade of all pilgrims in the many-sided quest for truth. In his preface he acknowledges a Platonic idealism while closing hands with his realist brethren—surely such a generous and synthetic mind, standing for many of the great ends in social philosophy that Professor Dewey champions, ought not to be entirely dissatisfied if pragmatists rise from his pages with the conviction that scientific method as he outlines it is incompletely applied to metaphysics unless some of the assumptions of orthodox realism are replaced by assumptions of operational relativism. In any event the growing number of younger minds in philosophy who dislike all of these rubrics, and glimpse a day when the conflicts of the present schools will be shelved in favor of new issues and the method of debate between diverse sets of pretentious absolutisms superseded by patient coöperative research into the conditions affecting the solution of philosophical problems, will not only be grateful for all that Professor Cohen has contributed to the analysis of scientific method but will also feel one with him in the moral confidence that nothing is more to be prized than reason (however much or little it may objectively exist) by all who love truth and wish to make honest intelligence prevail in human affairs.

E. A. Burtt

Cornell University

REVIEWS OF BOOKS

Collected Papers of Charles Sanders Peirce. Principles of Philosophy, Vol. I. Edited by CHARLES HARTSHORNE and PAUL WEISS. Cambridge, Harvard University Press, 1931. Pp. xi, 393.

For ten or fifteen years it has been the fashion for students of philosophy to speak of C. S. Peirce as the greatest American philosopher. Such an opinion, however defensible, had to be based on hearsay or on the very fragmentary published record available. We are now about to be put into possession of his collected papers in ten volumes.

The first volume reveals the great difficulty faced by the editors. They have undertaken to organize a mass of fragmentary and miscellaneous material in such a way that the first volume will cover in outline the whole range of the author's philosophy. Whatever advantages this plan has will appear only after the other volumes are available. Then the reader can judge for himself how satisfactorily the editors have distilled the essence of many documents. For the present we have no choice but to take their analysis as the basis of interpretation. Material organized by the author himself has an air of finality which an editor's organization lacks. It is by no means certain, however, that the author's judgment of his own work is in fact more reliable than that of patient scholars who come after him.

In putting their plan into execution the editors have found it necessary to piece together paragraphs and longer sections from the author's manuscript and published writing without regard to the actual order or occasion of those writings. Adequate memoranda seem to be furnished to enable the student to reconstruct such order and arrangement as the author did actually employ. In any case the effect upon the reader is that there still clings to the work of Peirce the fragmentary character which he had expected the collected works to dispel.

The first volume, if taken without too express a reference to those to come, is fairly unitary. It presents in Book I the author's interpretation of the historical and scientific influences in the formulation of his own ways of thinking; in Book II, his theory of the order of scientific and philosophical knowledge-systems; in Book III, his distinctive logical and metaphysical doctrine; and in Book IV, his account of moral and practical issues. As a whole it is massive, original, and profound. Though it is marred somewhat by unavoidable repetition

it moves continuously forward in the expression of a comprehensive world-view. It shows Peirce as preëminently a philosopher's philosopher. No one can imagine such a philosophy as his in the language of the street. In the first place, it is learned; he was a scholar. His reader must be alive to remote sources if he would follow the argument. In the next place, his language is esoteric and often as condensed as a mathematical equation. Then, too, the philosophy itself is as far as possible from the level of popular phrase-makers. There is no hint of philosophy in its consolatory, quasi-religious rôle. In the brief sample of the author's popular (*sic*) lectures on *Vitally Important Topics* (Bk. IV, Ch. V) he offers the most maliciously unpopular theory that philosophy is a theory, not a practice. He seems to go out of his way to draw philosophy aside from the market-place and the forum.

I cannot say that this volume holds any surprises for one who had known Peirce by the works already published. It rather confirms or emphasizes such observations as that he learned much from scholasticism, especially Duns Scotus; that he was radically anti-nominalistic; that he learned much from Kant; that in style and content he resembles Hegel; that he conceived his own philosophy as the philosophy of continuity; that his primary interest was in logic and metaphysics; that he had a strong mathematical and scientific bias. If there is anything surprising it may be the increasing marvel at the fact that William James could ever have been supposed to be an expositor of Peirce. That is indeed inexplicable. Any resemblance between the two men is most superficial. Royce, on the other hand, saw eye to eye with Peirce at more than one point. The publication of the works of Peirce will almost certainly shed new light on the late work of Royce, *i.e.*, *The Problem of Christianity* and *The Principles of Logic*.

Nearly all precise interpretation of Peirce must still wait. This volume serves only to sharpen the appetite for what is to follow. It would be a rash critic who would begin the interpretation of central doctrines without having at hand the large body of material upon which the editors have based their selection for inclusion in the first volume. We have as yet only a sample, however well chosen it may be. It would not be very surprising if the same remark must be made when we have reached the tenth and last volume. There is that about Peirce which is incurably fragmentary. He thought first thoughts rather than last ones. His reflection was germinal, fructifying, and reconstructing. His mind was an example of his own theory of the

scientific mind as an inexhaustible fountain of living hypotheses. It may also be taken as an example of his theory of signs through the function of which individual minds participate in the work of mind. There is a flagrant arrogance about him. He flouts his reader or bluntly declares the superiority of his conclusions over those of various Aristotles and Hegels with an innocent impudence which disarms criticism. His ironic wit flashes out in unexpected places and is directed quite impartially toward himself, other men, opinions, manners, or esoteric logical and metaphysical doctrines. He stabs the reader awake at every turn. The effect of his style is to purge the argument of private opinion whether that opinion be the author's own or another's and to leave the naked reason revealed in the language of objective evidence.

H. G. Townsend

University of Oregon

Belief Unbound: A Promethean Religion for the Modern World. By William Pepperell Montague. New Haven, Yale University Press, 1930. Pp. 98.

This *confessio fidei* of one of our most distinguished contemporary American metaphysicians must be regarded as an important philosophical pronouncement. It is a book which few who take it up will care to put down until they have reached the last page. The style is of exceptional distinction. The substance is stimulating even when it is not convincing; and there are passages that are genuinely moving.

The book consists of three lectures delivered before Yale University on the Terry Foundation. The first of these deals with "The Modern Challenge to the Old Religion". Professor Montague begins by offering his definition of religion. It is, he says, the acceptance of "a momentous possibility—the possibility namely that what is highest in spirit is also deepest in nature, that the ideal and the real are at least to some extent identified, not merely evanescently in our own lives but enduringly in the universe itself" (p. 6). It is "the faith that there is in nature an urge or power other than man himself that makes for the kind of thing that man regards as good" (p. 8). The question of religion is therefore "the question whether the things we care for most are at the mercy of the things we care for least" (p. 66). "A man may well believe that this dreadful thing is true. But only the fool will say in his heart that he is glad that it is true" (p. 67)—one of many effective words which Professor Montague aims at the contemporary efforts to construct a merely humanistic religion. How admirably right-minded is this beginning!

The lecturer next proceeds to deal with the three phases of Christianity against which, in his opinion, the modern temper mainly revolts—its authoritarianism, its asceticism, and its supernaturalism. With the attacks on the two former he is in complete agreement; with the attack on the last-mentioned he is only in partial agreement. We are so much at one with the *main* drift of Professor Montague's contentions that we find ourselves wondering what embodiment of Christianity he is really attacking. Whatever may be true of the unchanging Roman Church, who can say that contemporary American Protestantism is suffering from authoritarianism, asceticism, or supernaturalism? Our own feeling is that such Protestantism has reacted too much rather than too little against these features of the older religion. It will therefore be seen that while we share (and have shared these twenty years since our undergraduate days) the lecturer's essential impatience with certain features of traditional religion, we do think that his impatience is carried to very extreme and one-sided lengths. Much of what he writes against authoritarianism does not really touch Catholic orthodoxy, which never taught that "duty is obedience to what is commanded" (p. 11) or that morality was "based on a divine power" (p. 12); though it may be effective against the nominalism and voluntarism of Occam and Duns Scotus and Calvin. Then we are really astonished to find Professor Montague thinking that he can dismiss the whole ascetic strain in man's ethical history by saying that "the ascetic begins by inhibiting some desires as a means to gratifying others, and winds up by regarding inhibition as an end in itself" (p. 13). He himself goes so far in a contrary direction as to write, "The notion that Temperance possesses intrinsic moral virtue is as false as it is ancient" (p. 61); and he takes issue not only with Mr. Irving Babbitt but even with Mr. Walter Lippmann, because they teach "a gospel of temperance, restraint and self-control verging upon asceticism" (p. 62).

The second lecture sets forth in brief the lecturer's ethical theory and is a plea for what is called "a sanctionless morality". Again we are a little puzzled to know who is being argued against. Professor Montague almost writes as though he supposed that it was orthodoxy that was in the habit of attaching sanctions to morality! As a matter of fact, it is only the most radically heterodox of moralists—particularly Hume, Bentham, and Mill—who have thought that such sanctions were necessary, and their opinion has usually been a scandal to the pious. Sanctions may be defined as superadded inducements for being social rather than egoistic in one's conduct; they therefore appear in

the history of ethics as a means of transition from egoistic hedonism to utilitarianism. Among Bentham's sanctions 'the religious sanction' is recognized, and it seems to be this religious sanction that Professor Montague has mainly in view. His argument is against the idea that "the validity of moral ideals depends on God's will" (p. 64). We need not repeat that Catholic orthodoxy has steadily set itself against any such doctrine, holding it utterly wrong thus to separate God's will from His reason and to set the former above the latter. The view defended by Professor Montague is exactly that of Kant, who argued against theological ethics and in favor of an ethical theology. "Religion as the foundation of morality", we read here (pp. 64 f.), "should be abandoned. . . . But there is still the possibility of a religion that should be the supplement and sequel to morality." From the first Kant's view has been recognized by the Church as being at least far nearer to its own teaching than the "sanctioned" morality of Bentham.

It is surely unjust to suggest that the thought of God enters the moral thinking of the religious man as an *extra reason for doing his duty*. Where it enters is rather in his attempt to understand *what duty means*. What the religious man feels is not that, apart from God, the moral life would go unrewarded, but that it would lose its depth and its significance. If Professor Montague were to attack the view, not that moral ideals depend for their validity on the divine Will, but that they depend for their meaning on the divine Mind, then he would really be attacking something that orthodoxy believes. And to some such belief as this ethical reflection seems to the present reviewer to be more and more moving, feeling (as it appears to do) that thought cannot rest quite finally in the Kantian concordat here defended by Professor Montague that religion is "the supplement and sequel to morality instead of its illegitimate and precarious basis".

The ethical theory which Professor Montague himself defends is utilitarianism; happiness is the *summum bonum*. He accordingly follows those who explain value in terms of desire, for happiness consists in the satisfaction of desires. But with this hedonic theory is combined an evolutionary theory, happiness being equated with "increment of psychic substance" or, more briefly, with "more life". The man who lives a good life can be shown to have more "abundance of life" than the man who lives a bad one, hence we are safe in taking "maximum abundance of life" (p. 57) as our criterion of ethical value. We confess that nothing in Professor Montague's argument disappointed us more than his reliance on this vague phrase and his apparent

ability to persuade himself that the man who lives well can be actually seen to be acquiring more psychic substance than the man who is living badly. Here indeed is a beautiful simplicity, with all annoying problems of ethics neatly solved! But unfortunately Professor Montague has to spoil it. After all, are all kinds of "life" and "psychic substance" equally valuable? The lecturer can perhaps consistently argue that "the ego of a hero or saint who includes in his own interests the interests of others is just that much more of an ego"; but in the end he has to admit that egos differ in *depth* as well as in breadth or width. "The greatness of a satisfaction", we read on p. 50, "depends . . . upon the breadth and depth of the ego to which the satisfaction pertains". And again, "Not merely in intensity but in volume and depth do values differ from one another" (p. 44). Thus while on p. 64 we read that "duty is nothing but the claim of the *greater* upon the lesser self", on p. 38 the little telltale word is slipped in and we are told that "conscience is indeed the call of the larger *and higher*, but fainter self". Again on p. 53 an illicit transition appears to be contained in the phrase "not just to do what I desire, but to do what I desire to desire, what I know I ought to desire". But obviously to desire to desire a thing is not the same as to know one ought to desire it. When the young Augustine prayed, "O God, give me chastity, but not yet", he knew he ought to desire the immediate emergence within him of pure desire, yet he did not desire such immediate emergence. But how long must we continue to be patient with attempts to explain away this category of oughtness in terms of something other and simpler and more "naturalistic" than itself—O Lord, how long?

This reference to *depth* as well as breadth of satisfaction may easily be passed over as a surprising lapse from consistency by the reader of these lectures who has not already read the author's essay on "The Missing Link in the Case for Utilitarianism" in the second volume of the *Columbia University Studies in the History of Ideas*. There is indeed one sentence in the present lecture in which the position there worked out is hinted at. "Spirit and its potentialities", we read on p. 44, "derive their incommensurable dignity, not from an alien and absolute quality, but from the infinity of quantity by which their dimension exceeds the lesser dimension of bodily needs." The present reviewer offered a criticism of this position in the HIBBERT JOURNAL for October, 1927, and he need here only repeat one observation which he then made. Professor Montague differs from previous utilitarians in admitting that "no amount of analysis can reduce the qualitative hierarchy of moral valuations to the quantitative hierarchy of degrees

of happiness". In order to square this admission with his acceptance of the hedonistic hypothesis he asks whether "it is not possible to regard one thing as infinitely or incommensurably greater than another without conceding a difference in quality". To which of course we can only reply that it is possible. Undeniably an *infinite* amount of anything, such as happiness, would be "infinitely and incommensurably greater" than a finite amount of it; but one finite amount could not be "infinitely and incommensurably greater" than another finite amount—and obviously it is only finite amounts of happiness that can ever be in question with mortals like ourselves. How, then, are we to avoid the conclusion that this suggestion contains an elementary fallacy?

Only one other point in this lecture need be noted. "In the teachings of Jesus we find, alas, no clear word concerning animal suffering and our duty to mitigate it" (p. 58). Are we right in suspecting that no criticism of this teaching would be more pleasing to Jesus Himself than this one? Was the Blue Cross Society wrong in taking as its symbol the tree on which He died?

The concluding lecture is entitled "God Finite and God Infinite". It contains a most persuasive statement of the case against humanism. "Though finite", we are told, "man needs the infinite to complete and unify his own being" (p. 95). And this infinite he can get; he can get "a living contact with something other and infinitely higher than himself" (p. 92). By such union—so run the last words of the book—"one's world will be made radiant, and one's life become a high romance". But Professor Montague holds that the pressure of the problem of evil (which he is surely right in thinking to be the one really serious obstacle to belief in God) makes it impossible to attribute to this infinite God an infinite will. To him God is therefore "a will of finite power working within the confines of an infinitely extended and all-inclusive mind" (p. 84). "The finite will of an infinite God" thus sums up his theology, God being "an infinite, all-inclusive cosmic life, whose will to good is single, pure, and finite, one force among many in that chaos of existence which God finds within himself" (p. 91). God's will "though not omnipotent, is omnipresent" (p. 98); hence God is not an eternally perfect being but "an ascending force, a nisus" (p. 74). The puzzle how a being can be infinite without being omnipotent is solved by the strange conception of God as having "an internal environment". "That in God which is not God is God's environment, and *that* is the world" against which his finite will is engaged in struggling (p. 83). But what are we to make of an anthropomorphism which takes so literally the distinction between will and in-

tellect in God that it can hold the former to be finite and the latter infinite? Professor Montague argued powerfully against the nominalist error of *universale post rem* whereby the divine will was made more ultimate than the divine reason. Is he not now falling into the equal and opposite error of *universale ante rem*, making reason more ultimate than will?

In this final lecture, then, we are given the outlines of that religion which is "the supplement and sequel to morality" though not its foundation. Yet, when it has been presented to us, we are surprised to find ourselves sympathizing with the humanists (who, as we are told on p. 5, equate religion with devotion to our ideals) rather than with Professor Montague in one important respect. For Professor Montague makes far too little of the organic connection between religion and morality. To him they are fundamentally separate activities of the soul which merely "supplement" one another. To us they are abstractions which our analysis-loving minds make from the single organic whole of our spiritual life.

One is interested in asking, What is the real source and spring of Professor Montague's several divergences from the Christian tradition? Surely the answer is clear. It is, every time, his hedonism. He will have it that happiness is the best thing there is. He will pursue his hunt for the "missing link" whereby the moral consciousness may be naturalized into "happiness" or "satisfaction of desire" or "increase of psychic stuff"—the missing link between nature and supernature. And *of course* you cannot support the Christian tradition on that basis. Who has ever supposed that you could? *Of course*, the Christian emphasis on temperance and restraint and the whole ascetic strain in Christian teaching cannot be made sense of on hedonistic premisses. *Of course* the problem of evil becomes completely insoluble on the hypothesis that happiness is the highest good. The problem of evil is how to reconcile the facts of life as we know them with the belief that this world is under the control of an omnipotent Goodness. For one who does not believe in an omnipotent Goodness there is no problem of evil—there is nothing to be explained. To deny that God is omnipotent is not to solve the problem of evil, but to give it up—and to give it up in royal fashion. But what other alternative is there for one who believes that happiness is the be-all and end-all of our life? How could anybody possibly pretend that this world is under the control of One who makes all things work together for our *happiness?* That is an affirmation which could not survive the fires of actual human experience for five minutes, let alone for three thousand years.

But suppose I believe that the be-all and end-all of life is, not happiness nor "maximum pace of living" (p. 63), but something vastly different, some entirely higher spiritual quality of character; then am I quite so sure that the problem of evil has no possible solution? Can I quite so lightly and confidently assert that this is not the kind of world in which *character* can best be produced? There have been those who have claimed that "Life's just the stuff to try the soul, educe the man".

Speaking of the great Greek tragedies and of how, though they ended in apparent defeat and death, the onlookers left the amphitheatre with the feeling that through it all some deeper value was being realized, Professor Gilbert Murray writes, "What is significant is that from the very beginning the tragic conflict has in it an element of mystery derived ultimately from the ancient religious conceptions of *Katharsis* and atonement. The contest takes place on a deeper level of reality. It is not to be estimated in terms of ordinary success or failure, ordinary justice and injustice, but in those of *some profounder scheme of values in which suffering is not the worst of things nor happiness the best*" (*The Classical Tradition in Poetry*, p. 66). If Professor Montague could only accept the existence of such a profounder scheme of values, without trying to reduce it to anything less "mysterious" or "supernatural" or "absolute" than it has always been taken to be, we believe that everything else would fall into place, and his divergences from the Catholic tradition of religion (which, though important, are not many) would inevitably disappear.

We have concerned ourselves mainly with those aspects of Professor Montague's book which seemed most open to criticism. It is unnecessary to add that we have done this, and done it at such length, only because we have felt that the book is far too important and distinguished a contribution to be allowed to go undiscussed.

JOHN BAILLIE

UNION THEOLOGICAL SEMINARY

Les mythes de Platon. Par PERCEVAL FRUTIGER. Paris, Félix Alcan, 1930. Pp. 294.

There have been so many advances in Platonic studies during recent years that it is well to have the problem of the myth in Plato reexamined. M. Frutiger has accomplished this task with learning and sympathy. He has apparently mastered the voluminous literature on the subject and has subjected it to severe but on the whole just criticism. It is to be hoped that he has finally disposed of some doctrinaire views that do little justice to the seriousness and sincerity of Plato,

and others that show little understanding of the complexity and variety of the mythical element in Plato's writings. We can no longer accept the view that the myths are for Plato merely idle tales without serious meaning, or mere ornaments intended to amuse, or devices to mask his religious incredulity or bring about the moral edification of the reader. M. Frutiger's criticism of these always partially and sometimes wholly erroneous theories is able and fair. There would be little profit in considering it in detail here, but it is to be hoped that it will be taken into account by all future students of the Platonic myths.

Unfortunately, in attempting to formulate a single and comprehensive theory of his own, M. Frutiger seems to fall into something like the error which he so often criticizes in his predecessors. Any attempt of this sort meets a fundamental difficulty at the outset, the problem of definition. What are the marks whereby we can determine whether a given passage in Plato is mythical or not? M. Frutiger rightly rejects Couturat's view that we can determine what passages in Plato are mythical by the presence of the word *mythos* or certain equivalents; such a view is naive, considering Plato's known looseness of terminology. Equally superficial is Croiset's proposal to take as mythical whatever is expounded in the form of continuous discourse instead of dialogue. Having rejected these two criteria as delusive, the author proceeds to draw up a list of passages that are unanimously regarded as mythical and to educe from them certain common characters. He arrives at the conclusion that "any passage may be called mythical in which the exposition is symbolical, or deals with matters . . . that are not within the range of dialectic and are put forward as probabilities only, not as certainties" (p. 37). To be just to him, M. Frutiger would be the first to disclaim anything like formal accuracy for this definition, and the last to insist that myth and dialectic are two mutually exclusive heads between which the content of the dialogues is to be divided. The contrast of myth and dialectic is intended only to bring out the fact that there are some doctrines in Plato that he did not regard as capable of proof, matters of faith rather than of knowledge; and M. Frutiger recognizes that these two realms of faith and knowledge are not sharply set off from each other, but have many intermediate gradations separating their extremes.

Nevertheless M. Frutiger's attempt to find the essence of myth in its contrast with dialectic encounters difficulties. For one thing it ignores a character of the myth that seems equally essential, *viz.*, its symbolism. Though he includes this in his formal definition, M.

Frutiger makes no use of it, so far as I can see, in his discussion of particular passages. In every particular case the decision whether a passage is mythical rests upon the question whether the doctrine it expresses is regarded by Plato as fully established or as merely probable. Thus the doctrine of immortality in the *Phaedo* and the *Republic* is not a myth, but a scientific certainty established by dialectic. Likewise the idea of the Good and the theology of the *Laws*. On the other hand, the origin of language in the *Cratylus*, the origin of the state in the *Republic*, the three parts of the soul in the *Republic* and the *Timaeus*—all are mythical, because these are doctrines that Plato regarded as merely probable. A curious case is the allegory of the cave in the *Republic*. M. Frutiger refuses to regard this as a myth, since it expresses a theory of knowledge that has been dialectically established. Equally strange is his judgment on the doctrine of reminiscence. When it is advanced in the *Meno* it is a myth, because there it is not established by dialectic (and M. Frutiger assumes, no doubt, that Plato did not then know it could be so established); but when it occurs in the *Phaedo*, it is supported by proofs and therefore ceases to be mythical. To me some of these results seem exceedingly paradoxical, evidently due to the fact that M. Frutiger has sacrificed the symbolical character of the myth to his attempt to contrast myth and dialectic. He has centered his attention, we will admit, upon the more interesting and important problem of determining what doctrines Plato regarded as proved, and what were for him merely matters of opinion and faith. But it seems highly confusing to identify this problem with that of distinguishing the mythical from the non-mythical elements in the dialogues. Is every statement of mere opinion in the dialogues to be regarded as mythical? This does violence to language. And does Plato never use myth to expound a doctrine that he regards as certain? To deny this is to do violence to Plato.

So far as a positive understanding of the rôle of the myth in Plato is concerned, the third part of M. Frutiger's work is much the most satisfactory. There he shows the importance of the myth in the literary tradition preceding Plato, and the poetic and imaginative quality of Plato's mind. He shows clearly that in studying the myth in Plato we cannot without arbitrariness confine the inquiry to the great myths of the *Republic*, *Gorgias*, *Phaedo*, and *Politicus*. These are connected by an unmistakable tie of kinship with the numerous allegories and fables that abound in the dialogues, and these in turn with the metaphors, personifications, the poetic imagery and turns

of phrase, shown on almost every page. They are all varying forms of the natural medium of expression for a man whose thought even about abstract concepts was always so vivid that he could not express it without calling upon the resources of his rich poetic imagination. The myth of Er, the son of Armenius, is only a more elaborate product of the qualities of mind that led Plato to compare the idea of the Good with the sun, or thoughts in the mind with pigeons in a cage. To see the identity of character that pervades all this imaginative adornment of the dialogues, so intimately connected with the qualities of his mind that it is no mere adornment, is to render unnecessary the search for any ulterior significance in his use of the myth; and it likewise renders futile, I think, M. Frutiger's attempt thus to distinguish what Plato regarded as established truth from what was for him mere probability.

There is much to be learned from M. Frutiger's discussion of particular passages. He shows that the doctrine of immortality was for Plato a demonstrated belief, and one whose certainty was in no wise lessened by the difficulty of reconciling the unity of the soul as put forward in the *Phaedo* with the later doctrine of the three parts. Again he is right, I think, in looking upon the psychology of the *Republic* not as a mere *ad hoc* invention to provide an interesting parallel with the three classes in the state, but as a serious effort to explain the facts. On the other hand, his contention that Plato consistently adhered to this view in his later writings seems to me difficult to sustain. In the *Laws* and *Politicus* Plato believes that the soul is made of parts, but it is difficult to identify the parts distinguished in these dialogues with the three parts so clearly set forth in the *Republic*. Again it is a welcome contrast to the usual treatment of the *Laws* to find that M. Frutiger regards the theology of the Tenth Book as a fundamental part of Plato's metaphysics. His treatment of Plato's political views is less satisfactory. When he denies that the *Republic* and the *Laws* are myths it is hard to know what he means; this statement seems to imply, in view of his criterion of myth, that Plato regarded his political doctrines as dialectically established. Certainly this is not true of any except the fundamental principles of Plato's politics, perhaps not true even of them. On the other hand, to maintain that in the *Republic* and the *Laws* Plato is not endeavoring to discover the real origin of the state, and that he places himself exclusively at the point of view of values, overlooks Plato's manifest dependence upon Greek history and tradition. His politics is not the construction of his poetic fancy, but a serious, though tentative, description of the factors at work in political life and the ends to be realized there. To introduce the question

whether his political theories are mythical or not is irrelevant and beclouds the issue. M. Frutiger has had his eye throughout upon the problem of distinguishing fact from fancy in the dialogues, and has done much to further the solution of the problem. But one cannot help thinking that he would have done more if he had not been embarrassed by the misleading attempt to define the mythical and distracted from the more promising road that leads through the study of Plato's logic and dialectic, and the possibly non-logical foundations of Plato's thought.

GLENN R. MORROW

UNIVERSITY OF ILLINOIS

Moral Sense. By JAMES BONAR. New York, The Macmillan Co., 1930. Pp. 304.

Taking the moral-sense emphasis in English philosophy as a notable and isolable phenomenon in the history of ethical speculation, Mr. Bonar here treats Shaftesbury as its founder, Hutcheson as its prime builder, David Hume as a doubtful follower and eventual damager, Adam Smith and Immanuel Kant as its able critics, the one boring from within, the other from without. Conscious, however, as he says, of the precarious position in which the derivation of moral merit from a sense all its own leaves intellectual virtues and natural gifts and graces, the author rounds out in a concluding dialogue with Shaftesbury the wholesome many-sidedness of the founder of the school. Though the movement implied a fairly clear-cut conception of a special faculty, after the analogy of the five bodily senses, delivering "right decisions, if not indeed right principles", it did not maintain itself in a single exponent, not even in Hutcheson, as a univocal doctrine. Hume, though extreme in latitude with reference to the point of view, illustrates the fast-and-loose treatment accorded the notion of a special moral sense by all who accepted it. Out of his materials it would be possible, as Bonar correctly observes, "to construct (1) a theory like Hutcheson's, explaining morality by a Moral Sense, which ratifies acts tending to Public Good; or (2) a theory like Adam Smith's, which explained morality by Sympathy without a Moral Sense; or (3) a theory explaining it by Utility alone, as was done by Bentham. Hume professed to retain all three" (p. 141). Hutcheson himself becomes not merely the first user of the phrase "the greatest happiness for the greatest numbers", but also a notable, though not pure, expounder of the utilitarian principle.

Mr. Bonar touches divertingly upon these men, following their writ-

ings chronologically. He passes lightly over such then contemporary critics as Mandeville and Berkeley, John Brown and Richard Price. More emphasis is given Butler's elevation of the moral sense into a conscience that is reflective as well as perceptive, authoritative as well as locative. Adam Smith is discussed at greater length than any other character, greater even than Hutcheson. Kant's relation to the doctrine is in eighteen pages conventionally treated, with no discussion, however, of his explicit indebtedness to the school in his pre-critical period.

A short review is hardly the place in which to essay a discussion, not even a summary, of all the philosophies touched upon in this book. But it may be fairly said that this is not the final book upon the subject. No fault can be found with an exposition for not being clearer than the subject itself, but a criticism should hardly match vagueness in text with vagueness in commentary. While there is here little or nothing to challenge on the ground of accuracy (though the reviewer would not like to be thought to agree with all the author's emphases), the treatment is not satisfactory. So far is it from being a straightforward and systematic development of the moral-sense motif in English ethics that one must know the literature of the eighteenth century well in order to give integrated intelligibility to the book; and if he is well enough informed to do this, the book will almost certainly strike him as being unsystematic, not to say discursive. It presupposes rather than imparts a textual knowledge of the moralists of the period; and yet it ties itself so closely to the philosophical texts that it well-nigh loses the interest it might have for a student in the general history of ideas. Impressionistic, not to say anecdotal, in temper, loosely literary in style, detailed in reference though unsystematically so, Mr. Bonar's book throws many interesting sidelights upon the century's thought-movement (Hume's early hypochondria, his continued indebtedness to Cicero, Robert Burns' borrowing from Adam Smith, Shaftesbury's reactions to Locke, etc.); but it does not give the serious philosophical student either new and fruitful leads or a systematic and exhaustive summary of the theory of the moral sense.

There is no mention in the book of David Hartley. And yet he gave one of the clearest accounts available from the period of the genesis of the moral sense—such an account as did not lose through natural genesis the moral authority sought by the school. "This moral sense", Hartley concludes his discussion of the subject in his *Observations*, "therefore carries its own authority with it, inasmuch as it is the sum total of all the rest, and the ultimate result from them; and em-

ployes the force and authority of the whole nature of man against any particular part of it, that rebels against the determinations and commands of the conscience or moral judgment."

T. V. SMITH

UNIVERSITY OF CHICAGO

La pensée de Rabindranath Tagore. Par SUSHIL CHANDRA MITTER. Paris, Librairie d'Amérique et d'Orient, 1930. Pp. 182.

In spite of his protests the poet's admirers insist that he is a philosopher. Both are in a sense right: he is a religious thinker—like the Upanishadic poets and the Buddha—whose philosophy is not systematic, but cannot be ignored or denied. After a brief preface by Dr. Sylvain Lévi, who finds in Dr. Tagore one of the two guiding voices of India in travail, and a full bibliography of four pages, Professor Mitter proceeds to trace the sources of the poet's thought, and then to discuss what he calls his transcendental humanism.

This discussion—the latter half of the book—is the more original, but the first half is equally useful to all who need such a summary. Professor Mitter is well-qualified by birth, training, and occupation to make it, and he gives us a clear and sympathetic account of Tagore's sensitive childhood, the influence of his father, the Maharshi, his adolescent promise, and his brilliant achievements as educator, poet, and thinker. The Upanishads, the Bhakti singers of Bengal, Buddhism and the songs of the people, have all entered into the soul of this eclectic—but it is to Kabir, the weaver-poet, and to Rammohun Roy, the synthetist, that Tagore owes most. A son of the Brahmo Samaj, he has sung as no one in our time the praises of the Unseen Lover, and in this devotional dualism Dr. Mitter finds his distinctive thought.

In the poet's Jīvandevatā, "Lord of my Life", he sees a new doctrine of the Self. Agreeing with Bergson that this world is a process of change, Tagore, more poet than philosopher, sees in the calm and peace of personal communion the proof that there is an abiding reality. His devotion to this ideal expresses itself in many ways and his Asram, Santiniketan—Abode of Peace, is a practical expression of it. If it breaks down in his own tendency to criticize without welcoming criticism, and in his failure to recognize that a sound internationalism must be based upon a healthy nationalism, that others in fact have as much right to love their own heritage as he, this is the failure of human weakness. In nationalism he sees the curse of our time, and in the "big and complex" organization of our civilization the hall-mark of materialism. The West would more readily listen to his indictments if it felt that he had sought to see deeper into its ideals.

The book concludes with a brief account of the poet's educational work; but unfortunately it has no index, and the reviewer is unable to check his impression that far too little attention is given to the influence of the West upon Tagore, whose music, drama, educational theories, and philosophy, have been more influenced than he knows by the "material" West. Nor is there enough consideration of the influence of Buddhism, which inspires the poet not only by its international spirit but by its central philosophic concept. The contrast between the unreal and the real, the transient and the permanent, the restless and the calm—it is this which the great thinkers and artists of Buddhism try to express, and it is this which Tagore has chosen as the central thought of his own mystical transcendentalism. Why drag in Bergson when the Buddha, twenty-five centuries before him, made Nibbāna—the Calm State—his central and abiding Reality?

KENNETH SAUNDERS

Aeternitas: A Spinozistic Study. By H. F. HALLETT. Oxford, Clarendon Press, 1930. Pp. XIX, 344.

"Though I am an Englishman, my belief in metaphysics as the source of genuine knowledge of the Real, is naked and unashamed." Continuing from this introductory confession, the reader shortly discovers that Professor Hallett has presented here for consideration a metaphysical essay rather than a strictly expository treatment of Spinoza; literally a "Spinozistic Study", not a "Study of Spinoza". Not content with analyzing Spinoza's system, he has identified his own position with certain of its aspects as he understands them, and has permitted himself "to subordinate to the broad current of intellectual development, the nicer distinctions between what was thought and what was implied, between what was implied and what was inferred" (p. viii). This he does with the acknowledgment of a personal preference for "the creative spirit to the inert letter of an unfinished system".

Attention is at once directed to consideration of the nature and relations of time, duration, and eternity. Neither mortality nor immortality provides an adequate account of man's destiny, which is to be explained by a true account of the meaning of eternal. Effort is made both to correct mistaken interpretations of Spinoza's use of eternity and to "expose and resolve" false popular conceptions, especially those which would offer descriptions in terms of continuance through endless time. Eternity is not "a direct or . . . an inverse

function of time" but "the ultimate stuff of reality". It is the "very essence of God" and it "reveals itself in each and all of the infinite Attributes and *affectiones* of Substance" (p. 322). Division is essential to duration, which carries the distinction of past and future or their equivalents. The Real is not divisible into earlier and later stages and cannot be said to endure; here existence is of another kind, *viz.*, eternal.

As for time, our author would "deny explicitly that past, present, and future belong to time itself, as such; they must be ascribed to the relations of the individual *subject* (corporally and mentally) with the contents of time" (p. 21). Past and future are connected within the "specious present", itself a perceived duration. Apart from contents, past and future are indistinguishably alike, and macrocosmic time is seen to possess no absolute dates whatever within its continuity. Duration has to do with modes, but Substance requires eternity, itself a kind of existence *par excellence*, following solely from the nature or essence of the eternal thing (*Cf. Ethics*, I, Def. VIII). For man, our author insists, it must be remembered that a temporal existence, in so far as it is purely temporal, is the same as non-existence. By coming to know himself and the objects of his world not as "perishing fragments" but as "eternal existences" a particular man attains relative perfection, becomes free, and "'proves by actual experience' that he is eternal" (p. 62).

Spinoza, it is insisted, is not a pantheist. Individuation is not mere division. It is not on his passive, but on his active side, that man is eternal (p. 154). He may be eternal *as* finite mode, since Substance does not destroy the mode, but incorporates it in wholeness (p. 302). The individual, taken at any single moment of his duration, is not merely incomplete and partial but "in time he is even incompletely himself". From this falling short of his own "eternal stature", rather than from any inability to express an absolute perfection, comes his sense of imperfection and of sin. Individuality is not lost in an eternal absolute, as Bosanquet believed; rather it is only there that individuality, as an eternal thing, can be realized adequately. "As we respond more and more fully to a wider context we gain power and freedom in the moral life, and more nearly approximate our temporal individuality to the eternal that we are" (p. 303). The belief that Spinoza says or implies that "persons are merged in the ideal continuum of the infinite intellect" our author believes to be an error of interpretation which may be traced back to Martineau's "masterly misunderstanding", and which has persisted even in the thought of Bosan-

quet and Pringle-Pattison. But whereas this interpretation was accepted by the latter, Spinoza's real thought, it is contended, was rather that expressed in Pringle-Pattison's own position: "Truth, beauty, love —all the great values—what meaning have they apart from their conscious realization in a living individual, finite or infinite?" (Hallett would "omit, but not exclude, the term *conscious*". *Cf.* pp. 316 ff.; 313 n.)

The reader approaches the conclusion of the book with a feeling of admiration for its mature scholarship and with a delight in the power evident in the development of its argument. With these, in the reviewer's mind, at least, lurk persistent doubts as to the validity of the exegesis at numerous points, chief of which is that involved in the central contention of the book, namely, the account given of Spinoza's view of the eternal individual. It is impossible to discuss so intricate a problem here, but in passing it should be recognized that our author has attempted a difficult task in undertaking to present both a position of his own and the exposition of a classical philosopher simultaneously. At many points his success is unquestioned, and the result is both valuable and interesting. At others one is inclined to feel that his devotion to Spinoza and his enthusiasm for a specific philosophical position, taken jointly, may result in an interpretation and weighing of textual evidence which is not likely to prove generally acceptable. Despite possible disagreements, however, serious students of Spinoza will respect and value Professor Hallett's contribution for many enlightening points of insight and for the strength of its vigorous Spinozistic enthusiasm.

Clifford Barrett

Princeton University

Art and Scholasticism: with other essays. By Jacques Maritain. Translated by J. F. Scanlan. New York, Charles Scribner's Sons, 1930. Pp. 232.

Ten years ago M. Maritain published the first edition of his *Art et scholastique*. Three years later it was translated into English under the title, *The Philosophy of Art*. Since that date several French editions have appeared, from the latest of which Mr. J. F. Scanlan made the present translation. In addition to the original title-essay on "Art and Scholasticism" this book contains three shorter essays on æsthetics and a series of supplementary notes, some of which may be considered as separate brief studies on problems of detail or on questions related to the main theme of the book. The translator is evidently competent

but not uniformly exact in his translation. Certain passages are almost unintelligible unless recourse is had to the original French.

In France M. Maritain enjoys an established reputation as a stylist and a philosopher. He is also well known and appreciated outside his own country. Mr. T. S. Eliot has spoken of him as "the most conspicuous figure and probably the most powerful force in contemporary philosophy". One may or may not concur in that high praise, but to have read this book, where M. Maritain is at his very best, is to realize the fact that such praise might be seriously given him.

The philosophical treatment of the nature of Art and Beauty is entirely scholastic. A metaphysical analysis of these concepts results in a definite separation of the two ideas. Art is a practical habit or virtue. Beauty is a transcendental attribute of reality. Because modern æsthetics restricts the concept of art to the fine arts and consider beauty only in relation to art it "runs the risk of spoiling the proper conception of both". The artist is a workman, a producer. His art is drudgery, a bit of hard labor. Inspiration is not art, although it may be the motive power behind the production of a work of art. His aim is not to copy nature but to clothe in visible form, by the work of his hands and the sweat of his brow, the ideals which his intelligence reveals to him. Yet "beauty does not consist in conformity to a certain ideal and unchanging type in the sense that to perceive beauty man shall discover the invisible essence of things and their necessary type". There is no rigid academicism in M. Maritain's philosophy of art. One cannot but feel that he retains much of the fine influence of the Bergsonian critique of arid intellectualism. Yet he is far removed from Lipps and Volkelt with their *Einfühlung* theory. He will have none of that projection or infusion of the emotional self into the perception of beauty. For him, the principle of intelligibility in a work of art is the very source of the mystery it suggests yet conceals. For "mystery exists where there is more to be known than is offered to our apprehension". That principle which renders the work of art at once intelligible and mysterious is the form, the idea, which verifies the material object (the work of art) and makes it apt to disclose some glimpses of eternal truth and beauty. That is why he says that the greatest works of human art are as so much rubbish destined to be burned on the Last Day when the Splendor of Eternal Truth and Beauty will stand revealed before the blessed.

Blended with this fascinating metaphysics of art and beauty there is in M. Maritain's thought a strong sympathy with what many would call a Bohemian irresponsibility in the artist. He is not inconsistent,

yet the combination is so startling that it provokes curiosity. The explanation is put, perhaps, most clearly in a long note on the representation of the nude, from which I quote a few sentences: "As for the freedom of the artist with regard to the subjects he is to represent, the problem seems to be as a rule badly stated, because it is forgotten that the subject is merely the matter of the work of art. The essential question is not to know whether a novelist can or cannot depict such and such an aspect of evil. The essential question is *from what altitude* he depicts it and whether or not his mind is pure enough and strong enough to depict it without connivance."

There is no prudery in the æsthetic philosophy of M. Maritain (who, by the way, is an intimate of a motley group of artists in the Quartier Latin and the editor of the well known literary collection *Le roseau d'or*) yet the poise of his philosophy is largely due to the *altitude* of his metaphysics. Those who admire the details of his work and think his doctrine, considered as a systematic whole and a theoretical justification of his attitude, to be nothing but a jumble of philosophical inconsistencies, miss the whole point of his discussion of beauty and the work of art. His work is valuable as a thoroughly consistent (some would also add acceptable) study of the problems of æsthetic philosophy in which traditional conservatism and modern freedom are blended without confusion or compromise.

Gerald B. Phelan

University of Toronto

Die Kunst. Von Broder Christiansen. Buchenbach in Baden, Felsen-Verlag, 1930. Pp. 260.

This book is written by a man familiar with the fine arts and especially sensitive to the beauty of poetry. His analysis of rhythm is very revealing, though some of his findings strike one as fanciful, and his metaphysics seems unnecessary to his æsthetics.

He wisely tells us that the best way to get at the essence of art is to observe what artists avoid as dangerous to their art. They are equally shy of realism and illusion; they try to shut out the question of reality and do not want it raised, because they do not want practical interests to be aroused. Art, then, stimulates an equilibrium of incipient responses which an overt, practical reaction would destroy. Life is given to art by a rhythm of stressed and unstressed elements. Form is given to art by the choice of a common denominator through which the whole is kept in the same style or mood. But rhythm is the fundamental thing.

There are four modes of rhythm. (1) The direct, which proceeds in *decrescendo* from tension to resolution. This is classic and restful; it has a sense of the past, as in Homer and the mature Goethe. (2) The reversed mode, going in *crescendo* from resolution to tension. This is Gothic and strenuous; it is filled with yearning for the future, as in the young Goethe and Nietzsche. The opening lines of the *Divina Commedia* are quoted to show that Dante is Gothic. The French language is Gothic. The final flourish of a tower rushing upward is Gothic, and Gothic pictures reverse the usual perspective so that they come forward. (3) The fully tense mode: tension to tension, a strenuous balance of stress and stress. Old German poetry had this rhythm. (4) The completely resolved mode: resolution to resolution. This is easy and dreamy—*rococo*.

The author thinks that Goethe has combined the four modes in this stanza:

> Vom Vater hab' ich die Statur,
> des Lebens ernstes Führen;
> vom Mütterchen die Frohnatur
> und Lust zu fabulieren.

The first line is the reversed mode, giving the character of his father; the third is completely resolved, representing the nature of his mother; while the second and fourth lines are classic, as Goethe was in his maturity.

An important mixed mode is the barock, in which two resolutions lead up to a stress that is suggested but not given. In the Laocoon the strongest moment has not yet arrived. In the resting Hermes of Naples there is quiet preparation for springing up. The barock is not an asymmetrical form but an antisymmetrical form. It prepares for symmetry, then contradicts it to force the spectator to imagine what is lacking.

The account of the way rhythm is marked in portrait-painting is interesting. In Holbein's Erasmus the mouth expresses the strain of study, while the eye reflects the pleasant relief of a well turned sentence. Sometimes a portrait-painter balances an inquiring eye with a contemplative one.

In spatial art the natural movement is from left to right and is naturally a progression from tension to resolution, so that the introduction of a movement from right to left increases the tension. In architecture the balance is between weight and support. Music and the dance are shown to follow the four modes much as poetry does.

Good prose differs from poetry in having a subtler rhythm. The

beauty of poetry consists in delicate variations and displacements of the ordinary speech-patterns, and in doubling and reversing of variations. Good prose must outdo the nice deviations that distinguish poetry from ordinary prose.

In all art the rule is the basis for innovations and surprises achieved by departing from the rule. Because art is created with reference to the conventions and expectations of the day, delicately deviating from them, many subtleties are lost in time, and poetry fades like painting. But sometimes colors are improved by fading, and in time poetry may gain the charm of the antique, which arises in differentiation from what is customary.

It is variations of inner tone that count, since all external qualities are translated into "inner" tones in this book. Every material has its own inner tone, which must be considered in relation to the inner tone of the artist's purpose. A glass with the same inner tone would not be equally suitable to the inner tone of milk, of sparkling wine, and of dark, sweet wine. Colors and lines have inner tones which may be used to bring out the inner tone of a man so that a caricature of him will look more like him than he does. It is the inner tones of objects that the poet suggests through words. Metaphor makes vivid the inner tone of things, as in these two quotations: "On certain days the corn looked like a sleeping child." "The seagulls looked as if they were all named Emma."

After arguing that the important thing in art is not sensuous externals but inner tones, the author says that in all great art there are arrows pointing to a higher life close to God. The artist is indeed the instrument of God, and, as children play with blocks, building towers they could not erect in reality, so God plays in art, to practice in easy material before undertaking further creation in the more resistant stuff of nature.

VAN METER AMES

UNIVERSITY OF CINCINNATI

DESCRIPTIVE NOTICES

Die Theorie der Geisteswissenschaften vom Altertum bis zur Gegenwart. Von FRANZ SCHMIDT. Muenchen, Ernst Reinhardt, 1931. Pp. 149.

Judged by German standards this outline of the theory of the cultural sciences from antiquity to the present is very inadequate. The classification is faulty, the selection is arbitrary, the exposition often a paraphrase of first and second hand sources, and important thinkers like Savigny, Marx, Weber, and Scheler are not treated at all. These defects arise from the fact that the author apparently has no grasp of the fundamental problems involved in developing a special methodology for the social and cultural sciences. His very summaries are disjointed and repetitious. The publishers, however, have done their best with it; it is beautifully set up and printed.

SIDNEY HOOK

NEW YORK UNIVERSITY,
WASHINGTON SQUARE COLLEGE

The Spirit and Substance of Art. By LOUIS W. FLACCUS. Second Edition. New York, F. S. Crofts and Company, 1931. Pp. xi, 484.

The first edition of this work appeared in 1926, and the printing of a second edition is proof that it has answered a demand. Of the six parts in which the book is divided, the first two deal with the field and methods of æsthetics, the origins of art, and the æsthetic response. The third considers each of the principal arts individually, and the fourth discusses the Beautiful, the Sublime, the Tragic, and the other chief æsthetic types. In the fifth are considered a variety of 'isms—Classicism, Romanticism, Expressionism, etc. The sixth part is devoted to certain general problems including, for example, that of the relation of art to life.

In the second edition the *errata* of the first have been corrected, a few footnotes have been added, and illustrations have been inserted. Aside from this it is an exact reprint of the first, with only the addition of a chapter on "Some Newer Developments" to Part VI, and of a short appendix of notes supplementing at a few points the text of the first edition. A score or so of titles of recent works have been added to the bibliography. The new chapter considers briefly the innovations of technique, spirit, and aim during the last decades in the realms of architecture, sculpture, painting, epic poetry, the novel, and the drama.

C. J. DUCASSE

BROWN UNIVERSITY

De la connaissance de soi. Par Léon Brunschvicg. Paris, Félix Alcan, 1931. Pp. xi, 196.

Psychology and biology (ch. I) do not give us self-knowledge because they tell us only of our past and not of our destiny. The latter is a function of the material and spiritual duplicity of the values mankind develops in the course of his evolution (chs. II and III), historically exemplified by the attempt to control nature by magic (ch. IV). Humanity can know itself only through its rational functions, such as language (ch. V), politics (ch. VI), art (ch. VII), science (ch. VIII), moral action (ch. IX), and finally, through spiritual absorption with truth and love (ch. X). The failure of man to combine these functions consistently results in the "closing in on itself" of that world of discourse, or the life of reason, which should "open an indefinite career to spiritual activity, that is to say, to self-knowledge" (p. 96). The author shows his characteristic erudition in supporting these conclusions of his rationalistic humanism.

Philip Paul Wiener

Paris, France

De Luther à Wagner. Essai de psychologie ethnique. Par N. Klugmann et M. Dumesnil de Gramont. 2 vols. Paris, J. Vrin, 1931. Pp. 228; 222.

De Luther à Wagner endeavors to explain the apparently fundamental oppositions of the German spirit, exemplified by astute and often brutal scientific accomplishments in the material world combined with almost mystical religious fervor and lyrical artistic temperament. All Germans possess a *Doppelseele:* a national characteristic distinguished by the ability to think and act contradictions simultaneously, whereas other peoples, with rare exceptions, can so think and act only successively. Such a thesis, the authors admit, is intelligible only on the acceptance of the newer "affective" logic which insists that contradictions are the way of life. They devote some four hundred pages to pointing out inconsistencies in the lives and works "des esprits les plus représentatifs de l'Allemagne". Fifteen pages suffice to develop the explanation. The work's chief merit is its objection to oversimplified explanation, such as that which opposes a pitiless and practical Prussia to a dreamy and sentimental South-Germany.

Merrill E. Bush

Cornell University

Genius and Creative Intelligence. By N. D. M. Hirsch. Cambridge, Mass., Sci-Art Press, 1931. Pp. 340.

This book, the work of a clinical psychologist, presents one predominant theory: that genius is a unique species, the outgrowth of subjective intelligence (instincts) and of objective intelligence (conceptual thought). But

even more pregnant in suggestiveness are the many sub-theories presented in perhaps too great multitude and rapidity, for they are not all well digested into the central thesis. For perspective, read the preface; for a hint of the farflung scholarship exhibited, note the index. Students proud of their hard-headedness may find both thesis and certain portions of the development a bit too "mystical". Significant notes, references, and hypotheses are the reward of him who reads patiently through the entire volume. Particularly interesting are the theory of laughter and the interpretation of Bergson. The printing is disappointingly uneven and needlessly microscopic; this, and occasional grammatical errors, detract from an otherwise painstaking work.

MERRILL E. BUSH

CORNELL UNIVERSITY

The Theory of Legislation. By JEREMY BENTHAM. Edited with an introduction and notes by C. K. OGDEN. New York, Harcourt, Brace and Company, 1931. Pp. lii, 555.

The International Library of Psychology, Philosophy, and Scientific Method has reprinted from the original plates Hildreth's translation (1864) of Dumont's French *Traité de la législation civile et pénale* (1802). To this has been added an appendix giving some of Bentham's views of the punishment of sexual irregularities from his manuscripts, with about a hundred notes and an introduction by Mr. C. K. Ogden. The introduction enunciates the unusual thesis that Bentham was one of the greatest and most original figures in European thought, comparable with Leibniz, Newton, and Helmholtz, and that in the next fifty years he will be so recognized. This thesis is supported by reference to six aspects of Bentham's work: his theory of language and linguistic fictions, his contributions to an international language, his psychology of value, his plans for the codification of law, his contributions to international law, and his service to humanitarianism.

GEORGE H. SABINE

CORNELL UNIVERSITY

Philosophical Poems of Henry More. Edited, with an Introduction and Notes, by GEOFFREY BULLOUGH. Manchester University Press, 1931. Pp. xc, 250.

The editor presents a picture of the intellectual influences which shaped More and to a considerable extent his contemporary, Cudworth, and the Cambridge Platonists. Preparation for the poems is made by a discussion of Plato, Philo, Plotinus, Justin Martyr, Clement, Origen, and Ficino, and by an account of More's own attempts to synthesize elements derived from Calvinism and the *Theologia Germanica* with the various interpretations of Platonism. The "Platonick rage" of the poems themselves would be buried from the sight of the present-day reader under the complexity of metaphysical

speculation, sesquipedalian Greek, and archaic English which More chose in addressing himself to the elect, were it not for the editor's care. Through his efforts, the poems are shown to have a value in comparison with the metaphysical poets (Spenser, Donne, Milton, Wordsworth) who struck a happier balance between mystical or rational intuition and sensuous presentation.

HENRY MYERS

CORNELL UNIVERSITY

Anthologie des philosophes français contemporains. Paris, Editions du Sagittaire, 1931. Pp. 533.

This anthology, edited by M. L. Pierre-Quint, and introduced by M. Armand Dandieu, who contributes a discursive preface, is not limited to selections from the writings of the most widely studied among contemporary French philosophers. It opens with Georges Sorel (1847–1922), includes such comparatively little-known names as those of Paul Langevin, Joseph Baruzi, and Louis Rougier, and closes with several pages taken from the work of René Danmal (born in 1908). Some of the twenty-two choices which M. Pierre-Quint has made are surprising. The philosophy of O. Hamelin, for example, is represented by selections made not from his *Essai sur les éléments principaux de la représentation,* but from his monograph on Renouvier. Each philosopher included is introduced by a short discussion of his system, and a bibliography of his writings is provided.

RALPH W. CHURCH

CORNELL UNIVERSITY

An Elementary Logic. By GREGORY DEXTER WALCOTT. New York, Harcourt, Brace and Company, 1931. Pp. xvi, 451.

This is another text-book in the field of introductory logic, and one that does not belie its name, since it is even more elementary than most books similarly entitled. The author adheres closely to the tradition in his treatment of deductive and inductive reasoning, devoting, however, somewhat more than the customary amount of attention to scientific method and statistics. A novelty of arrangement is the occurrence in virtually every chapter of a few paragraphs discussing fallacies related to the subject in hand.

E. T. PAINE

CORNELL UNIVERSITY

Philosophy and Modern Science. By HAROLD T. DAVIS. Bloomington, Indiana, The Principia Press, 1931. Pp. xii, 324.

This book sketches the development of physical science from Greek speculation to recent times by presenting the history of such conceptions as the atom, ether, gravitation, etc. The author's chief aim is to exhibit the meta-

physical nature of modern physical science; his contention is that empiricism and metaphysics, divergent throughout the ages, have come together to form modern science. That modern science is also poetical forms a minor theme.

SALVATORE RUSSO

CORNELL UNIVERSITY

Bedürfnis und Befriedigung. Von SIEGFRIED KRAUS. Wien, Julius Springer, 1931. Pp. xi, 109.

The subtitle of this book is "an inquiry into the underlying forces (*Hintergrundmächte*) of society". The inquiry has two main problems: first, to state the essence of desire, including both primitive and higher cultural desires; second, to formulate the conditions of the satisfaction of desires. Desire always involves the direction of an ego toward an object. Hindrance to desires is overcome by use of substitute-objects, especially in the case of adults. This substitution makes possible social harmony.

L. M. PAPE

UNIVERSITY OF CHICAGO

The Ethical Religion of Zoroaster. By MILES MENANDER DAWSON. New York, The Macmillan Company, 1931. Pp. xxviii, 271.

The book is composed essentially of quotations from translations of Zoroastrian writings. It is misnamed. It should be called the Religion of Zoroastrianism, inasmuch as most of the material is from periods much later than the founder of the movement and includes developments of thought which cannot be reliably ascribed to him.

Various aspects of the doctrine—such as the mission of Zoroaster, God, the Holy Spirits, worship of the Sun, Ahriman and the Evil Spirits—are treated in separate chapters with relevant quotations drawn from writings early and late. As a consequence there is no clear presentation of the earliest ideas, nor of the development of the movement through later centuries. At most it presents the conglomerate of ideas which an uncritical orthodox follower of present-day Parsiism would hold. It is of some value as presenting a glimpse of one type of oriental mind, but it is inferior to what it might have been if based upon a more historical perspective.

A. E. AVEY

THE OHIO STATE UNIVERSITY

The Secret of the Golden Flower. A Chinese Book of Life. Translated and Explained by RICHARD WILHELM, with a European Commentary by C. G. JUNG. Translated into English by CARY F. BAYNES. New York, Harcourt, Brace and Company, 1931. Pp. ix, 151.

A translation of a short work from an esoteric circle in China, said to have been transmitted orally for a long time, then committed to writing. The first printing of it is from the eighteenth century. A new reprint in

1920 was distributed among a small group of persons interested in a new religious movement which arose out of the political and economic conditions in China. Its content is an expression of Chinese yoga practice. The volume contains a translation of the T'ai I Chin Hua Tsung Chih; essays on the origin and contents of the book, the psychological and cosmological premises of the text; and a commentary by Jung covering the contrast between the oriental and occidental psychologies and the fundamental concepts of this Chinese work. It is interesting chiefly because of the difficulty for western appreciation.

A. E. AVEY

THE OHIO STATE UNIVERSITY

Creative Worship. Swarthmore Lecture for 1931. By HOWARD H. BRINTON. London, George Allen and Unwin, Ltd. Pp. 94.

The book defends the thesis that the art of worship has been largely lost, because of the feeling of assurance which science gave at the close of the nineteenth century, but argues that there will be an inevitable swing in the opposite direction because of the fundamental character of the alternation from mechanism to organism and back in the interpretation of life. In fact this swing is already in evidence, with the rediscovery by science of the creative mystery of the universe. The thesis is developed around a discussion of the contrast between Puritanism, with its high estimate of mechanism, and Quakerism, with its high appreciation of organism.

A. E. AVEY

THE OHIO STATE UNIVERSITY

The Meaning of Music. By CARROLL C. PRATT. New York and London, McGraw-Hill Book Company, 1931. Pp. viii, 253.

This volume deserves the attention of æstheticians. The author, who is well versed in both music and psychology, presents a closely-knit argument as to the bases of musical effect. These he finds chiefly in the inherent qualities of tones and in the form-qualities which emerge when tones are combined either simultaneously or successively. He draws a sharp distinction between what is inherent in tonal sequences (and therefore at least potentially the same for all observers) and the ideas, moods, and emotions aroused by music, which vary widely for different observers. Since, however, he finds *movement* to be as truly inherent in tonal sequences as in visual, kinæsthetic, or organic sequences, he discovers a legitimate sense in which music is "the language of the emotions" and even, as Schopenhauer taught, "a copy of the will".

ALBERT R. CHANDLER

THE OHIO STATE UNIVERSITY

The Universe in the Light of Modern Physics. By MAX PLANCK. Translated by W. H. JOHNSTON. New York, W. W. Norton and Company, 1931. Pp. 120.

After some remarks about physical science in general the author turns to an exposition of Quantum mechanics in particular, and thence to an analysis of the various types of laws governing physical phenomena. In his view the popular opinion that causal interpretations must now be abandoned is not borne out by the facts.

H. R. SMART

CORNELL UNIVERSITY

Science and Religion. A Symposium. With a Foreword by MICHAEL PUPIN. New York, Charles Scribner's Sons, 1931. Pp. xii, 176.

The purpose of this book is to give a "personal interpretation of the relation of science to religion" by eminent churchmen, scientists and philosophers. Among the contributors are Julian Huxley, J. S. Haldane, E. W. Barnes, B. Malinowski, S. Alexander, and W. R. Inge.

H. R. SMART

CORNELL UNIVERSITY

Lucian, Plato, and Greek Morals. By JOHN JAY CHAPMAN. Boston and New York, Houghton Mifflin Company, 1931. Pp. viii, 182.

The book includes a biographical essay on Lucian, several illustrative passages from his works (in the Fowler or the Harmon translations), and two critical essays comparing Lucian with Plato. The thesis of the book is that both writers have been persistently misunderstood by scholars. The author regards Plato as a writer of brilliant romantic essays, living in a dream-world and having no serious philosophy; Lucian he regards as a serious moralist and critic of morals.

GEORGE H. SABINE

CORNELL UNIVERSITY

Intelligence in Politics, an Approach to Social Problems. By PAUL W. WARD. Chapel Hill, The University of North Carolina Press, 1931. Pp. ix, 126.

The book consists of five chapters having the following titles: Institutions and Institutional Change, The Meaning of Democracy, Law and Human Conduct, International Consolidation, and Situational Thinking in the Social Sciences. The philosophical point of view is determined by the author's acceptance of Professor Dewey's theory of the nature and functions of intelligence; this is developed chiefly in the last chapter. In the earlier parts the author argues that institutions exist for the purpose of controlling human conduct; that self-directive, or democratic, societies must be assumed to be

possible and the effort made to extend them; and that law is a mode of regulating and adjusting interests.

George H. Sabine

Cornell University

Experimental Psychology. By Johannes Lindworsky. Translated by Harry R. Desilva. New York, Macmillan, 1931. Pp. xix, 406.

It is probably safe to assume that the average American student has in recent years derived his knowledge of German psychology principally from the Gestalt polemicists. Professor Lindworsky cannot legitimately be classified as an adherent of this point of view, and the temper of his work is not polemical. If only to complete the perspective of German psychology, therefore, this translation would be welcome. But it is not untimely in view of the frequent neglect by American psychologists of "the higher mental achievements of adults". It is in the section—Book Three—devoted to this subject that the author's most original experimental and theoretical contributions appear.

Carl M. White

Cornell University

Die psychologische Autonomie des organischen Handelns. Von Johann Albrecht Loeser. Berlin, Gebrüder Borntraeger, 1931. Pp. viii, 146.

When cast in the mold of strict necessity, the subject-matter of psychology retains little of its original distinctiveness. Coming to grips with this problem, Dr. Loeser differentiates physical causation and psychical determination and contends that the relation between stimulus (*Reiz*) and reaction is essentially flexible or variable; that, in consequence, all explanations of organic activity in terms of a strictly "preformed-mechanical nature" are doomed to failure. With the ground thus cleared for *freie Reaktionen auf einfache Reize*, the author applies his new explanatory principle to various types of psychological and biological phenomena. The net result appears to be somewhat more deserving on the critical side than on the constructive.

Carl M. White

Cornell University

Desuggestion for the Attainment of Health, Happiness, and Success. By E. Tietjens. New York, The Dial Press, 1932. Pp. 594.

Ethics. By Nicolai Hartmann. Vol. III. Translated by Stanton Coit. New York, The Macmillan Company, 1932. Pp. 288.

College of the Pacific: Publications in Philosophy. Volume I. Lectures Delivered Under the Auspices of the Pacific Philosophy Club during 1931–32. Edited by Paul Arthur Schilpp. Stockton, College of the Pacific, 1932. Pp. 158.

L'envie. Par EUGÈNE RAIGA. Paris, Félix Alcan, 1932. Pp. xvi, 268.

Vers le concret. Études d'histoire de la philosophie contemporaine. Par JEAN WAHL. Paris, Librairie Philosophique, J. Vrin, 1932. Pp. 270.

Études sur Hegel. Par B. CROCE, N. HARTMANN, CH. ANDLER, V. BASCH, R. BERTHELOT, M. GUÉROULT, ED. VERMEIL. Paris, Librairie Armand Colin, 1932. Pp. 234.

Méditations cartésiennes. Introduction à la phénoménologie par EDMOND HUSSERL. Paris, Librairie Armand Colin, 1932. Pp. viii, 136.

Histoire de la Philosophie. Par ÉMILE BRÉHIER. Tome II. La philosophie moderne. IV. Le XIX^e^ siècle après 1850; le XX^e^ siècle. Paris, Librairie Félix Alcan, 1932. Pp. 907–1184.

Le problème philosophique de la guerre et de la paix. Par HENRI SÉROUYA. Paris, Marcel Rivière, 1932. Pp. 204.

Die Logik der heutigen Physik. Von PERCY W. BRIDGMAN. München, Max Hueber, 1932. Pp. xii, 172.

Der Möglichkeitsgedanke. Systemgeschichtliche Untersuchungen. Von AUGUST FAUST. 2 Bde. Heidelberg, Carl Winters, 1932. Pp. xii, 460; 356.

Religion und Gedanke. Von VITALIS NORSTRÖM. In deutscher Übersetzung mit Einführung von ELOF ÅKESSON. Lund, 1932. Pp. xl, 324.

Historische Grundlagen der Psychoanalyse. Von M. DORER. Leipzig, Felix Meiner, 1932. Pp. 184.

Husserls vor-phänomenologische Philosophie. Von WERNER ILLEMANN. Leipzig, S. Hirzel, 1932. Pp. viii, 88.

NOTES

Two prizes of £50 each have been offered by a member of the British Institute of Philosophy for the best Essays on Nicolai Hartmann's *Ethics*. Men and women of British birth, wherever resident, and under the age of 28, are eligible to one prize; and men and women of American birth, wherever resident, and under the age of 28, are eligible to the other. The Essays shall be of not less than 100 typewritten quarto pages, and must be submitted before the first of January, 1934, to the Director of Studies, The British Institute of Philosophy, University Hall, 14 Gordon Square, London, W. C. 1.

The following is a list of articles in current philosophical periodicals:

MIND, XLI, 163: *W. E. Johnson*, Probability: Axioms; *G. F. Stout*, Truth and Falsity; *W. A. Pickard-Cambridge*, Two Problems about Duty (III); *Alfred Sidgwick*, Uses of Formal Logic; *W. V. Quine*, A Note on Nicod's Postulate.

PHILOSOPHY, VII, 27: *C. F. D'Arcy*, Theism and Recent Philosophical Speculation; *Ian Gallie*, Oxford Moralists; *J. Johnstone*, Entropy and Evolution; *V. Burdwood Evans*, The Aquinate Proofs of the Existence of God; *James Drever*, The Present Position in Psychology; *E. M. Rowell*, The Size-Factor in Art.

THE MONIST, XLII, 3: *Charles W. Morris*, Truth, Action and Verification; *Chester Townsend Ruddick*, On the Contingency of Natural Law; *Paul Gastwirth*, The Hypothesis of Reducibility; *E. Y. Melekian*, Nietzsche and the Problem of Democracy; *Edward L. Schaub*, Goethe and Philosophy.

THE JOURNAL OF PHILOSOPHY, XXIX, 15: *Cornelius Krusé*, The Inadequacy of the Hedonistic Interpretation of Pessimism; *Ralph B. Winn*, On Zeno's Paradox of Motion. 16: *Charles Hartshorne*, Contingency and the New Era in Metaphysics (I); *Marie C. Swabey*, Is There Logical Force in Demonstration?

ANGLICAN THEOLOGICAL REVIEW, XIV, 3: *Thomas Leonard Harris*, Is There a Christian Ethic?; *Burton Scott Easton*, Pseudo-Phocylides; *Norman Nash*, Christian Social Ethics in the Seminary; *Alfred Newbery*, Bringing Out the Adult; *Burton Scott Easton*, Notes and Comments.

THE BRITISH JOURNAL OF PSYCHOLOGY, XXIII, 1: The Life-work of Carveth Read, 1848–1931; *J. W. Pinard*, Tests of Perseveration. I. Their Relation to Character; *R. G. Gordon* and *R. M. Norman*, Some Psychological Experiments on Mental Defectives in Relation to the Perceptual Configurations which may underlie Speech, I; *Shepherd Dawson*, Intelligence

and Fertility; *W. P. Alexander,* A New Performance Test of Intelligence; *Godfrey H. Thomson,* On the Computation of Regression Equations, Partial Correlations, etc.; *Norman R. F. Maier,* A Gestalt Theory of Humour.

JOURNAL OF EXPERIMENTAL PSYCHOLOGY, XV, 4: *H. Woodrow,* Effect of Rate of Sequence upon the Accuracy of Synchronization; *H. Helson* and *D. B. Judd,* A Study of Photopic Adaptation; *H. B. DeSilva* and *A. Weber,* Responsiveness of the Blind Spot; *J. J. Gibson, E. G. Jack* and *G. Raffel,* Bilateral Transfer of the Conditioned Response in the Human Subject; *W. C. Shipley,* Conditioning the Human Plantar Reflex; *J. Pessin,* Effect of Similar and Dissimilar Conditions upon Learning and Re-learning; *L. H. Cohen,* Periodicity of Recovery during the Refractory Phase of the Eyelid Reflex; *L. H. Cohen,* Negative Adaptation and Refractory Phase of the Eyelid Reflex; *L. H. Cohen,* Effect of Refractory Phase upon Negative Adaptation of Primary Reflex Response; *C. L. Constance,* Correlation by Calculating-Machine; *P. Horst,* Comparable Scores from Skewed Distributions; *P. Horst,* Difficulty of Multiple Choice Test Item Alternatives.

PSYCHOLOGICAL BULLETIN, XXIX, 7: *W. T. Heron,* Habit Formation and Higher Mental Processes in the Rat; *W. D. Commins* and *Calvin P. Stone,* Effects of Castration on the Behavior of Mammals; *C. R. Carpenter,* Relation of the Male Avian Gonad to Responses Pertinent to Reproductive Phenomena.

BULLETIN DE LA SOCIÉTÉ FRANÇAISE DE PHILOSOPHIE, XXXI, 4: *M. George-D. Birkhoff,* Une théorie quantitative de l'esthétique.

SCHOLASTIK, VII, 3: *Heinrich Weisweiler,* Das Sakrament der Letzten Ölung in den systematischen Werken der ersten Frühscholastik; *Joseph Ternus,* Dogmatische Untersuchungen zur Theologie des hl. Thomas über das Sakrament der Weihe, I; *Joseph Stiglmayr,* Zum Aufbau der Confessiones des hl. Augustin; *Gerhard Hartmann,* "Der Ursprung der Magier und die zarathustrische Religion".

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